COMPUTERWORLD

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Novell outlines plans for support of OS/2 under its Netware operating system. Page 8.

Backs to the wall at Hutton MIS

Shearson expected to scrap hardware, dismiss staff as part of merger plan

BY ALAN ALPER

NEW YORK — E. F. Hutton & Co.'s distributed computing architecture may be dismembered and a large number of its infor-

Wall Street aftershock

MIS staff at E. F. Hutton may face its own crash with Shearson Lehman expected to eliminate information systems duplication

mation systems employees dismissed as a result of Shearson Lehman Brothers, Inc.'s proposed \$1 billion acquisition, according to sources close to both companies.

Shearson's centralized pro-

cessing philosophy; observers suggested, is unlikely to accommodate Hutton's departmental Branch Information Processing System, known as BIPS, which provides office automation and local processing services to each of the firm's 400 branches.

"I don't think they'll keep [BIPS]," said a high-level Hutton MIS executive who asked to remain anonymous. "It's not a brand system."

Jack Owens, senior vice-president of information systems at Shearson Lehman, acknowledged that the merged company would not need all of the current information systems staff members from both companies but

Continued on page 8

DEC exec: Mainframe VAX in '88

BY JAMES A. MARTIN

ANAHEIM, Calif. — A Digital Equipment Corp. official last week confirmed reports that the company will release, by mid-1988, a mainframe-class VAX 8000 series system capable of performing about 22 million instructions per second.

The official also said DEC is exploring ways to extend the VAX architecture beyond its current 32-bit limit, thereby providing a performance growth path for the 1990s.

The next major VAX release carries the code name "Polar Star," according to Bill Demmer, vice-president of DEC's Mid-Range Systems Business Group in Boxboro, Mass. He said the release will roughly double the performance of DEC's current high-end VAX 8800, which is generally rated at about 12 MIPS. Demmer made his comments during Dexpo West '87, a

Continued on page 137

Lowe sees varied Micro Channel role

INFORMATION PROVIDED BY SHEARSON LEHMAN AND E. F. HUTTON

BY ED SCANNELL

WHITE PLAINS, N.Y. — IBM is piecing together a technical workstation strategy that will eventually yield multiuser versions of the OS/2 operating system on both IBM RT Personal Computers and high-end Personal System/2s, according to William C. Lowe, president of the company's Entry Systems Division.

This strategy, which will largely center on Unix, calls for an implementation of IBM's Micro Channel architecture on the RT PC. In a recent interview with Computerworld, Lowe also said the company plans to do the following:

Create bridges where necessary to better tie Unix with IBM's Systems Network Architecture.

• Implement the Micro Channel architecture bus on "the entire [PS/2] product line" as well as on a broad range of multiuser systems

 Make OS/2 Extended Edition run better on PS/2 systems by exploiting IBM's reported advantages in asynchronous inter-

 Build a System/36 "applications platform" on OS/2, but will focus on IBM's Systems Application Architecture to connect PS/2s to larger systems. Since July, when IBM merged the RT PC and PS/2 development teams, the company reportedly has been working on a series of products that will bring the two technologies closer tomether.

Continued on page 6

The 16K of memory is fine, but the price of punch cards is going through the roof

BY STANLEY GIBSON

As a computer, it may be a heck of a printer. But that beats being a boat anchor.

Some 28 years after it was first shipped and 21 years after it was discontinued, the IBM 1401 is still being run by several customers.

Although the machine can be programmed only in obscure languages, was dropped from IBM maintenance in 1981 and has a maximum memory capacity of a minus-

cule 16K bytes, a community of users is putting the machine to productive use.

In fact, several enthusiastically sing the processor's

The 1401 was the third IBM computer to use transistors and, because of its moderate

lyst at market research firm International Data Corp. Hart was an IBM salesman when the 1401 was introduced and says he sold several of the machines.

The processor enjoyed a highly successful life — some 12,484 were sold, according to IDC — before it was eclipsed by the landmark IBM 360 family of computers in the mid-1960s.

mid-1960s.
"You have to be a programmer over 40 years old. There are just not that many left. I happen to be of that age," says Don McCoy, president of Dallas Management, Inc.,

president of Dallas Computer Management, Inc., located in Dallas. McCoy pro-Continued on page 10



price, was the first to be avail-

able to a wide range of users, according to Jack Hart, an ana-

maximum memory IBM's 1401 still up and punching

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IN THIS

Scaling down. The fact that more corporate computing is being done on PCs inspires SAS Institute to bring mainframe capabilities like graphics, data entry and applications development to the SAS System for Personal Computers. Page 4.

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Quotable

"There probably never has been, or ever will be, another machine like the 1401."

> BILL PAPPAS MIR CORP.

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Hold that lawsuit!

Sybase says illegal copying charge a mistake

BY ROSEMARY HAMILTON

A 2-week-old legal scuffle between Oracle Corp. and Sybase, Inc. came to an abrupt end last week with Sybase admitting it had wrongly accused Oracle of illegally using and copying its software. It seemed like a David and Goliath story gone wrong.

Last month, Sybase, which got off to a fast start this year in the relational data base management field, took on Oracle, which has rapidly become a major force in this market. Oracle raked in \$131.3 million in revenue for its 1987 fiscal year, a 137% increase from last year's \$55.4 million.

The smaller Sybase ended up in the awkward position of withdrawing its complaint, leaving it in an even shakier relationship with its much bigger rival.

In the lawsuit, filed Nov. 23 in U.S. District Court in San Francisco, Sybase asserted that Oracle had wrongfully used and copied its software, the Dataserver and the Data Toolset, which were designed for on-line transaction processing environments.

In subsequent negotiations

between the two firms, it was learned that Oracle did not have the Sybase software, attorneys for both firms said last week.

Tables turned

The situation for Sybase almost went from bad to worse when the negotiations revealed that a copy of the Oracle data base management system was apparently at Sybase. Raymond Ocampo, assistant legal counsel for Oracle, said it first appeared that Sybase may have engaged in the very same activity of which it had accused Oracle.

Further investigation showed that the software in question belonged to a Sybase employee who had previously worked for Oracle. "There is no evidence that the software was obtained illegally or that it had been used," said Peter Courture, a partner at Wilson, Sonsini, Goodrich & Rosati, the firm representing Sybase.

Attorneys for both companies said that each has agreed to return any of the other's software that might have been in its possession, even though neither firm claimed to have had the other's software.

United data scrambled in O'Hare terminal fire

BY JEAN S. BOZMAN

CHICAGO — A small rubbish fire underneath the concourse at United Airlines' O'Hare International Airport terminal two weeks ago damaged voice and data lines enough to cancel 175 flights and strand thousands of passengers, United said last

"The reservation people had to handle everything manually, and they really couldn't keep up with the volume of work normally handled by our computer systems," United spokesman Joe Hopkins said.

On a normal day, more than 70,000 people pass through United's terminals, arriving or departing on one of 800 flights. Independent estimates put the number of stranded passengers at nearly 10,000.

Thousands of circuits hit

The fire, one of three that broke out on the evening of Dec. 3, began in an out-of-sight area near the terminal's baggage handling facility. By the time it was discovered, it had burned through protective sheathing around 5,000 multiplexed voice and data

circuits. The damage interrupted service at pay phones and reservation stations, as well as knocking out data to most United reservation CRTs at O'Hare.

"The cables were just a mass of copper and fused insulation," said Illinois Bell spokesman Richard Hill. "But even though they were in terrible shape, some of the data lines to the [United] Apollo reservation system kept working."

The problem worsened the following morning, when telephone repair crews started to replace the damaged lines. "In trying to repair the charred cables, live wires were cut," Hopkins said. He declined comment on whether United was internally investigating the fires, which were initially considered suspicious by the Chicago Fire Department. The fire department did not pursue a separate investigation, spokesmen said.

Suspicious or not, the fires at United's terminal and the summer flooding of other Chicago businesses show how vulnerable computer and communications facilities are to disruption. United's Chicago-area reservation service, located in nearby Elk Grove Village, was unaffected.



Since 1851, 24 challengers had failed to capture yachting's America's Cup. In 1983 the Australians finally succeeded with, by far, the fastest 12-meter ever built. The yachtsmen didn't make the difference. The technology did. The winged keel had been invented. Technology enhances performance.

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DAY AMERICAN

Airlines face Senate turbulence

Reservation systems cited for anticompetitive, anticonsumer potential

BY MITCH BETTS

WASHINGTON, D.C. — U.S. Sen. Howard M. Metzenbaum (D-Ohio) warned major airlines last week that they must resolve controversies over their computerized reservation systems or face a more drastic legislative remedy.

Airline-owned reservation systems "may be a potent tool of consumer deception and unfair competition," Metzenbaum said at the start of a hearing conducted by the Senate Subcommittee on Antitrust, Monopolies and Business Rights.

Several people critical of the way American Airlines and United Airlines have used their systems for competitive advantage urged Congress to require divestiture by forcing the airlines to sell their reservation systems to third parties.

The critics included consum-

er activists, who said the systems are biased toward their owners; small airlines, which decried the high fees they must pay to be listed on the reservation systems; and travel agents, who opposed contractual terms that discourage them from switching systems.

"As long as airlines own com-

RAVEL agencies argued that American and United impose onerous contract provisions.

puterized reservation systems, they can benefit from the incremental revenue that can be created by distorting traveler choices," testified Michael E. Levine, a management professor at Yale University. On the other side of the debate, executives who are in charge of American's Sabre system and United's Apollo system said there is no need for additional regulation or divestiture, which would rob them of their heavy investments in the technology.

"For the past several years, carriers that chose to invest their resources elsewhere have been attempting to use the legislative process and the courts to deprive American of the fruits cf its success," testified Michael A. Buckman, president of Sabre Travel Information Network, a division of American.

Travel agencies, the frontline users of the systems, argued that American and United impose onerous contract provisions intended to prevent them from converting to another system.

Because American and United together control more than

70% of the market, they can impose contract terms — such as high financial penalties for switching systems — on a "take-it-or-leave-it" basis, according to a representative for the American Society of Travel Agents.

A petition to DOT

The group urged the U.S. Department of Transportation or Congress to restrain the major airlines' market power by establishing a standard set of contract terms that would eliminate the abuses.

But officials from American and United said the contract terms are necessary to defend against Texas Air's recent efforts to steal customers away. The so-called conversion wars have landed in court because of disputes over breaches of contracts (CW, Nov. 30).

Northwest Airlines and Texas Air's System One Corp. subsidiary urged Congress to make it easier for travel agents to switch vendors, while America West Airlines and the Consumer Federation of America called for divestiture.

COMPUTERWORLD

Editor in Chief Bill Laberis Executive Editor Paul Gillin

News Editor Peter Bartolik

Senior Editors
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Senior Writer lichael L. Sullivan-Traino

Michael L. Sullivan-Traino

Sally Cusack

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Grophics Editor Mitchell J. Hayes Grophics Specialist Frank O'Connell Grophics Assistant Amy J. Swanson

Graphic Designer
P. Charles Ladouceur

Assistant to the Editor in Chief
Theresa Gallant
Editoriol Assistants

Patricia Faherty
Linda Gorgone
Lorraine Witzell

Rights and Permissions Manager

News Bureaus Mid-Atlantic 201/967-1350

Alan Alper, Correspondent

Washington, D.C. 202/347-6718

Mitch Betts, Correspondent

West Coast 415/347-0555

Kathy Chin Leong, Manager Julie Pitta, Senior Correspondent James A. Martin, Correspondent Stephen Jones, Correspondent Mary Elliston, Editorial Assistant

> Midwest 312/827-4433

Jean S. Bozman, Correspondent

IDG News Service Kathleen A. Gow, Director

Main Editorial Office Box 9171, 375 Cochituate Road Framingham, MA 01701-9171 617/879-0700

SAS widens PC line, improves portability

BY DOUGLAS BARNEY

CARY, N.C. — For the first time, graphics, data entry and applications development tools will be available on personal computers from SAS Institute, Inc., which today is scheduled to announce a new version of its SAS System for Personal Computers.

While SAS is still largely a purveyor of host-based applications, the new PC version of the software is part of the firm's overall strategy of bringing its mainframe capabilities to less expensive personal computers.

"With OS/2 and 386 machines, we will see a lot of corporate computing that is going to be done on PCs rather than a mainframe," SAS President James Goodnight said. "Our users have asked us to bring SAS, in its entirety, to the PC."

There are currently more than 270,000 licensed PC workstation users, according to SAS.

Three free modules

The new version of the PC software, set to ship later this month, includes three new modules: SAS/Graph, for graphics; SAS/FSP, for data entry, editing, querying and letter writing; and SAS/AF, for applications development. The new version will be provided free to licensed SAS PC workstation users.

SAS/Graph for PCs mimics

the features of SAS/Graph for mainframes and is aimed at sophisticated graphics applications. It includes the ability to produce three-dimensional graphics; scatter and contour plots; and surface, block and prism maps.

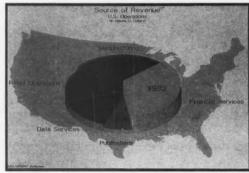
SAS/FSP is billed as a "complete information processing system" for data entry, querying, editing and letter writing. With the product, users can design data entry screens, work with data and create links to data base management systems such as IBM's DB2, the company said.

SAS/AF is an applications development system with menu design features. SAS said the product can create fill-in-the-blanks applications.

One user applauded the move. "The use of a personal workstation to do graphics or enhance your ability to do data entry or develop applications that could be uploaded to a mainframe is the direction to go in," said Mike Schmidt, manager of systems planning and administration for Moody's Investors Service, Inc. in New York.

"We would like to have an environment that is completely separate from a mainframe, where a programmer cannot accidentally write an application or test an application during production hours," Schmidt said.

But for some uses, the PC is not the answer, according to SAS. "The mainframe will have



A graphics module is one of three additions designed to bring mainframe-class capabilities to the PC version of SAS.

a larger variety of graphics output devices connected to it, such as the more expensive plotters and cameras," Goodnight explained. "Also, that is where the large corporate data bases are, so it will make sense to keep SAS on the mainframe for the really large jobs, such as overnight plotting and camera-ready art."

The portability of C

The SAS System for Personal Computers has been written in C to improve portability to other architectures, SAS said. This new PC software will serve as the basis for the firm's future host products, Goodnight said. "This system represents a single system that will run the same on all machines SAS software currently supports."

SAS enhanced its graphics, data entry and applications tools as it moved them to the PC. "We have added the ability to use a menuing system to menu each of the procedures in the graphics area," Goodnight said. He add-

ed, however, that the product is still aimed at sophisticated users. "It is still predominantly a mainframe graphics tool that has been brought down to the PC."

SAS also provides a communications link between its PC product and its host applications through SAS/Rterm, a terminal emulation program.

Existing PC modules have also been enhanced. The base SAS software features expanded data management tools. The software's statistical component, SAS/Stat, will include new procedures for analysis.

And SAS/IML, an interactive matrix facility for statistics, mathematics and engineering, will include 10 additional time-series functions and eight additional matrix functions, some aimed at solving quadratic and linear programs.

The SAS System for Personal Computers is licensed on a yearly basis. Prices range from \$495 for a single workstation to \$8,495 for 500 workstations.

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THE BEST OF SORTS:

First OS/2 users want more

Remains programmer's plaything until strategic pieces fall into place

BY ALAN J. RYAN

Soon after IBM dusted the country with 20,000 copies of its long-awaited OS/2 Standard Edition Version 1.0, early users said they were impatient for its other strategic pieces.

Some companies contacted last week said OS/2 will be only marginally useful - more of a programmer's plaything - until further releases, including communications capabilities in the Extended Edition and the graphical user interface of the Presentation Manager, become available. The Extended Edition Version 1.0 will ship in July 1988, the Standard Edition with the Presentation Manger will ship in October 1988 and the Extended Edition with the Presentation Manager will ship in November 1988, according to IBM. IBM began shipping the Standard Edition Dec. 4, but many who placed orders for it said they had not received it as of Dec. 11.

Early users said OS/2 is easy to install, lives up to IBM's promises and has few problems.

"I think OS/2 is going to become the standard environment for our intelligent workstations" over time, said Henwell Chou, a second vice-president with Travelers Insurance Co. in Hartford, Conn.

During the next six months, though, Chou said he sees little use for the operating system. "We'll be testing it and probably trying to develop software for it." he said.

Not for end users yet

A technical support specialist at a Fortune 100 company, who received a production copy of OS/2 late last week, said only programmers need OS/2 at the present time.

"If I were running a business, I'd have my heavy PC support groups running [OS/2] and using the compatibility box [the mode designed to preserve the user's investment in existing software] just to become familiar with it. But there's no reason for end users to get involved. There are no applications for it," the technical support specialist said.

One user at a major national bank, who has been working with a beta-test version of OS/2, said that while OS/2 "definitely does multitasking and definitely relieved our memory constraints, we don't have the Extended Edition, so we have to back away from our PC LAN for

now. The lack of communications in the Standard Edition has

limited its practical usefulness."

"We're impatient," said Joseph Brophy, senior vice-president of information systems and data processing at Travelers.

"We think [OS/2] is the right direction, but we want OS/2 Extended and all the tools and utilities so we can get it into the production environment."

"We're very much an IBM shop," said Ed Ginorio, manager of customer computing support at Dun & Bradstreet Corp. in Basking Ridge, N.J. But Ginorio said he is in no rush to purchase OS/2.

Users who did not chose to wait, though, said OS/2 has met their expectations.

The technical support specialist said it took less than a half-hour to install the operating system onto his IBM Personal System/2 Model 80. OS/2 arrived on four 1.4M-byte 3½-in. disks, he said.

"It has glitzy color screens that step you through the disk swapping and installation process and requires no reference to the manual," he said.

The program, the early users said, requires a minimum of 1.5M bytes of memory.

"It would not install on the 1M-byte PS/2 Model 60," said Ed Tolson, president of software developer Softlogic Solutions, Inc. in Manchester. N.H.

"Assuming you're going to run the compatibility box at all, plus some protected-mode applications, it's more reasonable to have 2.5M bytes to 3M bytes of memory," said Adrian King, director of product marketing for operating systems at Microsoft Corp., which co-developed OS/2.

Once installed, moving IBM PC- or Microsoft MS-DOS data, models and custom applications to ported OS/2 programs work in much the same way as setting up a new DOS machine.

The user would back up his disk, install OS/2 on the disk, copy data files back in and install the applications according to their instructions, King said.

A main feature of OS/2 is its ability to run DOS files, but the users and Microsoft said not all DOS files will run under the compatibility mode of OS/2

King conceded that there are some programs that will not work exactly the same way in the compatibility box of OS/2 as they do under DOS.

Executive Editor Paul Gillin, Senior Editor Douglas Barney and West Coast Manager Kathy Chin Leong contributed to this report.

So where is it?

tep right up. Get your OS/2 Standard Edition 1.0 here."
Sound familiar? Not likely. IBM shipped 20,000

copies of OS/2 on Dec. 4, but few have surfaced. Several large dealers contacted last Thursday said they had not received the new operating system but were expecting it. A spokeswoman at Computerland Corp. said OS/2 was due to arrive in the store's warehouses late last week and would have to be inventoried before being sent to dealers. She said it could be on dealer shelves by Dec. 16.

Businessland, Inc. said anyone seeking a copy will probably find it at Businessland by Dec. 21. Ira Lubert, president of Compucom Systems, Inc. in Cherry Hill, N.J., said his customers may find OS/2 in his store later this month.

ALAN J. RYAN

Lowe

FROM PAGE 1

"If we are going to build a series of workstation products that use both the Intel [Corp.]-based PS/2s and the reduced instruction set computing-based RT [PC] products, we would do a better job of it if we have them organized together," Lowe said. Demonstrating the flexibility

Demonstrating the flexibility of the high-end PS/2s, Lowe said, IBM will eventually support the systems in four different multiuser configurations: through the AIX operating system, as a System/36 platform, through a multiuser version of OS/2 and as a file server.

The RT PC reportedly will be used as a file server and multiuser system and will run a multiuser version of OS/2. The key to tying all these configurations together is SAA, Lowe said.

Integral to strategy

Turning to the potential of the Micro Channel architecture, Lowe said many people underestimate its abilities, adding that it will be an important part of the company's strategy throughout its entire family of products.

"Through time, you'll see the Micro Channel on quite a few implementations. For the same reason it makes sense for [the RT PC] people to talk of the re-

sources that have been spent on the Micro Channel, it will make sense for other people to interface with the I/O devices that we do for the PS/2. [And through multiple implementations], it also makes the job of SAA easier," Lowe said.

With the help of the Micro Channel architecture, IBM will be better able to run OS/2 Extended Edition on its systems than will compatible makers by

will compatible makers by exploiting the advantages they have in communications, Lowe said. He added that the area in which many inferior clone makers come up short is asynchronous interrupts.

"In a communications environment where you get a lot of asynchronous interrupts, we can really take advantage of the Micro Channel's capabilities," Lowe said.

IBM's apparent new commitment to Unix marks a departure from its lukewarm support in the past. Unix was previously provided as an "accommodation" to customers who felt the operating system was critical to running their businesses, Lowe said. During the past year, however, an increasing number of customers want Unix from IBM, Lowe said, adding that IBM centered much of its workstation strategy



William Lowe

for the RT PC and PS/2 around Unix.

Despite having OS/2 on the RT PC and AIX on the PS/2s, IBM intends to establish a consistent user interface across its workstation line, Lowe said.

Multistep process

He said this process will be done in several stages. The first step is putting the AIX/X Windows interface on both the PS/2 and RT PC. The second step involves putting OS/2 on the RT PC, which Lowe said gives that system "all the attributes of the PS/2

PS/2.
"So a likely thing to do is to take the steps to make AIX/X Windows conform," he said.
"But we aren't going to do things that make it difficult to port Unix applications."

In cases where there is an un-

compromising conflict between Unix and SAA, IBM will build the necessary bridges for developers to port over their applications, said Andrew Heller, vice-president and general manager of IBM's Advanced Engineering Systems Division. In most cases, he said, it is technically feasible to move people from one environment to another within the system without users realizing they have switched.

While the RT PC line and high-end PS/2s reportedly will be running both Unix and multiuser versions of OS/2 in the next few years, Lowe said there will be little overlan.

"In a couple of years, we'll probably have PS/2s that are higher performance than today's RT [PCs]. But we expect to have products in the RT [PC] family, at that point in time, which are substantially faster than the Intel-based products," he said.

The fact that IBM considers the RT PC an important Unix platform in the future comes as a surprise to many observers who believe the system has sold poorly since its introduction in January 1986. Heller admitted the original RT PC did not have the necessary software and expansion capabilities to make it successful.

compromising conflict between Unix and SAA, IBM will build the necessary bridges for developers to port over their applica-

IRVINE, Calif. — Users can expect systems compatible with IBM's Micro Channel-based Personal System/2s to be available by June, according to officials at both Western Digital Corp. and Phoenix Technologies Ltd.

The companies last week signed a joint development agreement to creat a series of read-only memory BIOS products. In combination with Western Digital's chip sets and board products, announced in October, the product will allow OEMs to deliver systems compatible with the PS/2 Models 25 and 30, both of which use the IBM Personal Computer AT bus, and the Micro Channel-based Models 50, 60 and 80.

There is tremendous interest in the BIOS products from OEMs, according to Bill Franks, vice-president and general manager of Western Digital's Strategic Products Business Units.

IBM has said it will not license design patents on the Micro Channel but will offer utility patents, providing vendors with the tools necessary to create a workalike system.

PS/2 legal web still tangles vendors

BY JULIE PITTA

SANTA CLARA, Calif. — Legal issues surrounding certain models of IBM's Personal System/2 family of microcomputers are still unclear more than eight months after the line's introduction, according to personal computer makers, chip manufacturers and resellers.

At a panel discussion here last week, industry figures expressed frustration at the lack of information regarding IBM's proprietary Micro Channel architecture.

Additionally, they said IBM has failed to prove that the new architecture offers any significant performance advantages over the company's Personal Computer AT bus.

"I'm appalled that it's eight months down the road and the industry still doesn't have a clear understanding of the patent issue," said Enzo Torresi, vice-president of product and strategic planning for Businessland, Inc. "I'm not going to be the first to resell [a Micro Channel clone] product."

Vendor reluctance

A number of microcomputer vendors, including panelist Safi Qureshey, president of AST Research, Inc., have publicly stated that they are investigating the possibility of producing a Micro Channel-compatible system, but they are reluctant to be the first to introduce such a product.

Gordon Campbell, chairman and chief executive officer of Chips and Technologies, Inc., said that he is not "aware of a single PC-compatible manufacturer" that is not looking to clone the PS/2 line.

Campbell said manufacturers' legal fears will delay PS/2-compatible introductions but not prevent them. Chips and Technologies has been in discussions with IBM's legal department for several months, he added.

Panelists said IBM has been

CORRECTIONS

The new Compaq Computer Corp. desktop personal computers, announced in October, carry 5¼-in. hard disk drives from Control Data Corp.

While CDC would like to ship Compaq a new type of 3½-in. drive, mentioned in Inside Lines [CW, Nov. 30], it has reached no agreement to do so, CDC officials said.

The 5¼-in. Wren drives that Compaq is using have a capacity ranging from 51M to 182M bytes, CDC said.

The telephone number for Centigram Corp. [CW, Nov. 9] is actually 408-942-3500.

adept at tying the Micro Channel and the OS/2 operating system, jointly developed by IBM and Microsoft Corp., together in users' minds

They added, however, that the two products are unrelated to overall system performance. "I can't find a single software advantage to the Micro Channel," said Gordon Eubanks, chief executive officer of Symantec Corp.

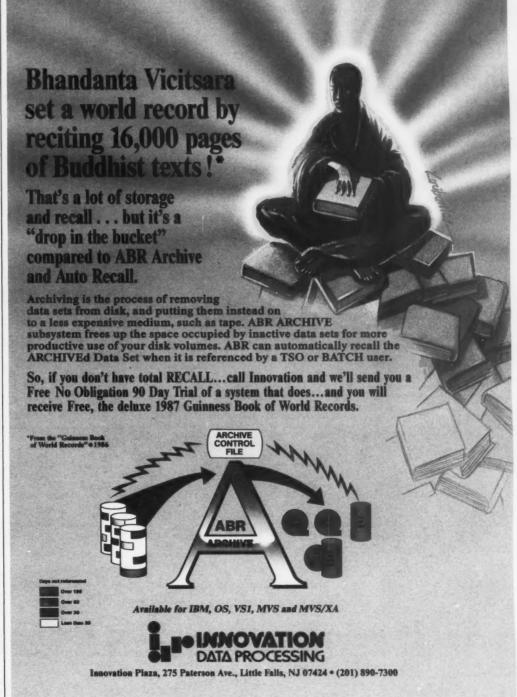
Other panelists said IBM has failed to prove any performance advantage gained through the Micro Channel. "It's been eight months, and they haven't proven

anything," AST's Qureshey said. "The benchmarks will have to be in real applications and real environments."

In a later speech, William Lowe, president of IBM's Entry Systems Division, defended the Micro Channel. "I/O suppliers at the Las Vegas Comdex (show this fall) told us that the Micro Channel offers functions that cannot be done on anyone else's

architecture base," he maintained. "The PC AT bus architecture was essentially out of gas."

Lowe said there are patents pending on specific elements within the Micro Channel. IBM does not intend to offer licenses to its design patents but has traditionally offered utility patents, which explain what a component does but do not detail its design.



Netware OS/2 support revealed

BY PATRICIA KEEFE

NEW YORK — Novell, Inc. last week outlined a two-pronged strategy to support OS/2 on a network server under its Netware operating system.

Novell's dual approach will provide users full compatibility with IBM and Microsoft Corp.'s OS/2 without affecting the performance of server-based applications, said Craig Burton, Novell's senior vice-president of corporate development.

In a briefing here, Novell set a first-quarter delivery date for supporting conventional distributed applications and external server-based applications under OS/2. The company also said it would support the OS/2 applications program interface, as defined by IBM, with its Netware Requestor.

Novell said it will deliver support for internal server-based applications running under OS/2 as well as support for OS/2 Extended Edition via the Applications Coprocessor board in the fourth quarter of 1988. Also planned is support for IBM's Advanced Program-to-Program Communications peer-to-peer communications protocol.

With these announcements, Novell attempted to puncture what it called the myth that the firm cannot support OS/2 on the network without licensing OS/2 and Microsoft's OS/2 LAN Manager.

Burton said developers will

not have to choose between Netware and OS/2. "It's true Netware is proprietary, but that does not mean that it is closed."

The Netware Requestor reportedly will support OS/2 Standard Edition-based workstations and is slated for delivery in the first quarter. It is priced at \$50 and will require Advanced Netware Version 2.1, which shipped last Friday.

A competitive product from 3Com Corp. that also supports OS/2 workstations is scheduled for delivery in the first quarter.

The Netware Requestor, developed by Novell with assistance from IBM, reportedly al-

lows OS/2-based workstations to coexist with DOS workstations and communicate with Netware servers.

Access to all Netware services is provided, and users will be able to run both DOS and OS/2 applications, Novell said. Users will run the Netware Requestor at their workstations alongside OS/2.

The Netware Applications Coprocessor reportedly will provide Netware support for OS/2 server-based applications in the file server. The coprocessor will ship in the fourth quarter following release of IBM's OS/2 Extended Edition, Novell said.

IBM nixes LAN boasts

BY ELISABETH HORWITT and PATRICIA KEEFE

BOSTON — IBM representatives last week seemed to contradict claims that applications written to 3Com Corp. and Microsoft Corp.'s OS/2-based network software will also run on IBM's own LAN Server program, which is based on IBM's OS/2 Extended Edition program.

"At this point, you cannot write to Microsoft's LAN Manager and have an application run on the LAN Server," said Edward Fritch, an IBM communications marketing manager. He said IBM is recommending that OS/2 software developers support IBM's Advanced Program-Communications (APPC) interface if they want to be compatible with IBM's distributed information systems plans.

"Developers want complete compatibility across 3Com, Microsoft and IBM, but I don't think this will happen," said Maurie Prauner, IBM's manager of local-area network products. While IBM incorporated pieces of Microsoft's LAN Manager into its LAN Server, "each vendor is providing its own enhancements" to the OS/2 networking software, he explained.

In a white paper released last month, 3Com guaranteed that 3+Open, its Microsoft LAN Manager-based network operating system, will be compatible with IBM's OS/2 LAN Server, and that 3Com would eventually support APPC.

IBM, "in its market-driven way," is trying to ensure that programmers cannot hook their software up to LAN Server's distributed networking functions except through APPC, according to Charles Pitcher, director of product planning for Rabbit Software Corp. This poses a quandary for users who eventu-

ally want to link their LANs to IBM hosts via IBM's LU6.2 but, meanwhile, want to use LAN Manager. Reportedly, LAN Manager is a simpler, less memory-intensive networking environment than APPC.

Another frustrated group, according to Pitcher, consists of would-be OS/2 software developers, who do not want to write an application once for the LAN Manager and again for IBM's APPC environment. "LAN Manager is much easier to write to than APPC for PC applications. I think the market will demand both APPC and the LAN Manager," Pitcher said.

"Some people are going to stick with IBM Netbios-plus capability," agreed IBM's Prauner. Small businesses that plan to link only personal computers may well be content with the Microsoft-3Com product, he said, but everyone else will want to migrate to APPC eventually, when they start linking their PC LANs to a distributed network of IBM hosts.

In an interview last week, Rob Glaser, director of network marketing at Microsoft, said IBM is not contradicting anything Microsoft has said. Developers' real concern should be designing their products to support OS/2, which IBM has endorsed as its server operating system, he said. IBM and Microsoft are partners in the OS/2 effort.

Fritch agreed that software written for OS/2, Netbios or IBM's PC-DOS 3.1 can access LAN Server. However, he said, IBM is "strongly recommending APPC" for users who want to ensure that their applications can communicate across a distributed IBM network.

Rabbit Software, a Malvern, Pa.-based developer of software for IBM's Systems Network Architecture, plans to offer its own implementation of APPC on the LAN Manager, Pitcher said. The firm also plans to develop its own hardware-independent version of IBM's Communications Manager, which provides LAN Server access for devices and applications supporting asynchronous, APPC, IBM 3270 and Netbios communications modes.

Hutton MIS

FROM PAGE 1

said that the firm has not yet decided which of Hutton's systems, including BIPS, will be retained. Most of the system questions, he said, are long-term issues that will be decided during the next four or five months.

"It would be foolish to do away with [BIPS] and all the soft-ware developed for it," Owens said. "We're going to take a hard look at the processors and see whether they're needed; it's a long-term question."

A busy mammoth

Just hours after agreeing to the acquisition, Shearson Lehman began the arduous task of planning how to tie Hutton's 400 worldwide branches to its own IBM Systems Network Architecture (SNA) network. Observers said they expect Shearson Lehman, an American Express Co. subsidiary, to rely on its mammoth processing capacity to handle the expected increase of business from the merged company.

Already, Shearson Lehman has ordered IBM 3270 terminals and modems as well as dedicated data lines so that Hutton branches can begin communicating on the SNA network as soon as the acquisition is completed.

"If we waited with work of this magnitude, we'd have a substantial delay integrating the firms," Owens said. "We'd lose some of the benefits of doing the

Hutton's initial step in building its corporate information network was made in the late 1970s with the installation of Data General Corp. Eclipse-class processors at its regional offices. A few years latter, Hutton installed BIPS, which is based on DG Eclipse MV-class minicomputers running DG's Comprehensive Electronic Office.

A DG spokesman said his firm is discussing with Shearson Lehman how to integrate BIPS into the SNA network.

Also up in the air is what Shearson Lehman would do with Hutton's Digital Equipment

Corp. VAXs, which are used in the capital markets arena.

Shearson Lehman, which is believed to have a significant amount of excess processing capacity, is in the midst of capacity planning to ascertain its systems needs. Owens declined to provide specific capacity figures.

"We're looking at things such as what we would need if we integrated our development environments and our time-sharing VM environment," he said.

Owens acknowledged that a combined firm with more than \$8 billion in revenue would not

into a combined DP/MIS unit is expected to take place during the next six months, Owens said.

Shearson Lehman's SNA network links the company's 330 international offices to an IBM mainframe complex in a state-ofthe-art data center in downtown Manhattan [CW, March 9]. The mainframe complex provides more than 200 different services, such as order processing and back-office tasks, to users on IBM 3270 terminals, Owens

"They've built a factory with a huge amount of MIPS [millions

Difference of style

Shearson Lehman will need to reconcile conflicting systems strategies when it acquires E. F. Hutton

	Shearson Lehman	E. F. Hutton
Departmental	None	400 Data General MV class systems, ranging from Models 4,000 to 20,000; 40 DG Eclipses; Wang VS systems; DEC VAX 8600s
Deaktop	3,000 microcomputers (Shearson Lehman estimate)	Bunker Ramo dumb and intelligent terminals to be replaced by 10,000 NCR personal computers during next year

INFORMATION PROVIDED BY SHEARSON LEHMAN BROTHERS, INC. AND E. F. HUTTON & CO.

need to keep all the DP/MIS employees from both companies. Shearson Lehman expects attrition to take care of some of the overlap, although there will be an as-yet-undetermined number of terminations, a company spokeswoman said.

"We're not going to fire only Hutton people," Owens emphasized. "We will take the best of both firms when we integrate."

MIS sighs

Wall Street observers said they expect anywhere from 4,000 to 5,000 Hutton employees to lose their jobs as a result of the acquisition; many would come from DP/MIS [CW, Dec. 7]. But many of Hutton's top DP/MIS people are not expected to wait for their termination notices, insiders have said.

The entire process of transferring the management and operations of Hutton's business of instructions per second]," said one industry observer. "It's a brick-and-mortar approach with no finesse."

Hutton, on the other hand. was an early adopter of distributed processing and has not been adverse to using non-IBM technology. It spent \$100 million over a seven-year period building a single corporate information network [CW, Aug. 11]. While the company is technologically advanced, it was forced to seek a suitor because it was severely undercapitalized, Wall Street watchers have said. Recent volatility on the world's financial markets exposed its vulnerability.

The company recently began installing some of the 10,000 NCR Corp. personal computers it ordered earlier in the year to enable brokers, executives and support personnel to access data anywhere on the network.

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Punch cards

grams his 1401 in the once-popular but now seldom-used Autocoder language

McCoy has one 1401 today, but had six until five years ago. The machines contain several ounces of gold, and when prices for that precious metal peaked a few years back, McCoy cashed in and sold five machines for scrap.

Makes good use of 1401

He uses his remaining 1401 to track information on 250 bowling leagues and as a backup for his IBM 370. Should his principal mainframe break down, McCov is confident that the 1401 can handle its work

load of payroll and general ledger work. It is a bit slower than the 370, though. One job that can be done in 27 minutes on the 370 takes seven hours on the 1401, he

McCov also uses the 1401 as an auxiliary printer. Should his 1,200 line/min printers be busy, he extracts data from the 370 onto magnetic tape and feeds it into the 1401. The 1401's printer can produce 600 line/min of very-high quality output, he says. He adds that a new 600 line/min printer would cost \$17,000, plus \$300 per month in maintenance.

McCoy states that the machine's 16Kbyte memory is not an extreme hindrance. "You just have to break a program into modules. You use the 16K over and over. If you wrote it for a big 370, you

would put it all into one program," he ex-

William Doyle, owner of Rand Associates in Coshocton, Ohio, another service bureau, operates three 1401s. He keeps one on-line, another as backup and a third for spare parts. The machines are used for payroll, billing and accounts payable. His principal and backup machines both use 4K bytes of memory. "In the old days, that was quite a bit," he says.

Doyle recounts that he bought his first 1401 in 1971 for \$44,000 and bought the next machine seven years later at a price of \$20,000. About four years ago, he purchased another for \$2,000.

In contrast, the price of the punched cards the systems use has gone up sharply from 91 cents to \$4.90 per 1,000, Doyle laments.

Vernon Durbin, head of Durbin Data Systems in Dallas, uses a 1401 with 16K bytes of memory for all his service bureau's jobs.

It works for him

"I have a PC I play on now, but it's still not like the old mainframe. It's wonderful for a service bureau," he says. Durbin runs his data center with his wife and one parttime employee. The data center's work consists primarily of processing the credit insurance that is sold with automobile loans and the like.

A 1401 user since 1962, Durbin bought his current machine in 1974 for \$10,000. He now pays \$400 per month to a third-party maintenance firm and says reliability is not a problem. The machine's only drawbacks are the large amount of air-conditioning it needs and the high cost of punched cards. "The price has gone sky high," he complains.

Like McCoy, Durbin programs in the Autocoder language, of which he says he is very fond. "It is possible to patch a program without recompiling it," he says, pointing out that is not possible with 360s and more advanced models, "The machine is very flexible. It made the computer industry.

Charlie Clem, president of Grand Prairie Data Services, Inc. in Grand Prairie, Texas, bought his 1401 in 1964. His service bureau continues to use the machine for payroll and accounts receivable.

Slow but dependable "It's slow, but its very dependable. It's very reliable," Clem says. His 1401 has 12K bytes of memory, six tape drives and a 600 line/min printer.

Like McCoy and Durbin, Clem programs his 1401 in Autocoder. He estimates he uses 40,000 to 50,000 punched cards per month.

Clem says he will keep running the computer indefinitely. If it breaks down and cannot be fixed, he will buy another, he says. "You can get one with 16K and a card-reader punch and four or five tape drives for \$2,000 to \$3,000."

Bill Pappas, president of Mir Corp., another Dallas-based service bureau, shares the enthusiasm of other 1401 devotees. "There probably never has been, or ever will be, another machine like the 1401,"

However, hardheaded reality won out over sentiment in Pappas's case. He sold the last of his two 1401s a year ago and cites space and heat considerations as the reason for the sale. Each went to a scrap dealer for \$2,000.

A good life

Pappas remembers buying a 1401 in 1968 for \$125,000 and recalls that a complete system retailed for about \$500,000

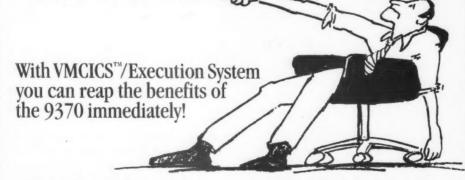
Pappas paid about \$15,000 in 1976 for his first 1401, which he says he used for programming and as a backup for his 360/40. He bought another machine several months later for about the same price and had been writing programs for the 1401 in the Fargo language, which evolved into the RPG language.

Although he programs on PCs today, Pappas says he is not dazzled with new

fangled technology.
"There is not a thing I do today that is not the same as I did then. Nothing has changed in 30 years. There is only more speed, storage and throughput," he says.

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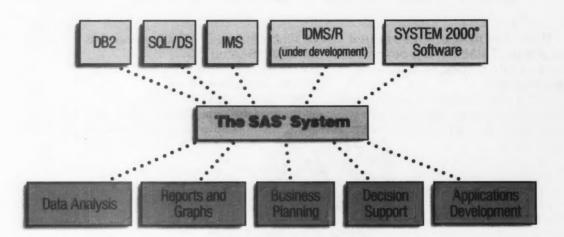
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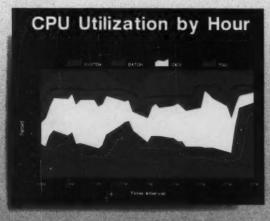
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CPU planning shift stresses dollars, sense

BY JAMES CONNOLLY

ORLANDO, Fla. — The role of a capacity planner or performance analyst may be shifting from advising an MIS director on which CPU to buy in two years toward getting the most out of existing systems or cost-justifying new applications.

Attendees at CMG '87, the Computer Measurement Group, Inc.'s international conference on performance evaluation, last week observed that capacity planners must break out of the niches in which they have been caught at many corporations.

Speakers at the conference stressed the importance of having capacity planners and analysts translate computer resource use into dollars and cents by showing senior management statistics such as a cost per I/O or the cost of a transaction for a new business venture.

'The big deal'

"A technology issue often is very hard to sell, but if you can make a financial case and a technological case and put them together, you have something to present to management — what we call the big deal," said Ed McDonald, division manager for information processing at Texaco, Inc. in Houston.

McDonald cited the example of Texaco's total replacement of IBM 3080-type mainframes with IBM 3090s during the past two years and said justifying that move to senior management would have been hard based solely on a capacity plan.

Charles E. Siegman, director of information systems at First Maryland Bancorp in Baltimore, advised attendees to become involved in their organizations'

Cobol to get second addendum

BY CHARLES BABCOCK

The panel that recommends changes to the Cobol language has agreed to petition its supervising body to begin a second addendum process that would bring proposed clarifications and corrections to Cobol 85 before public review.

Don A. Schricker, chairman of the X3J4 Committee of the American Nation-al Standards Institute (ANSI), reported that the committee wants to initiate the second addendum while the first attempt to invoke the addendum procedure and add intrinsic functions to Cobol is under way.

The clarification and correction procedure does not indicate there are special problems with Cobol 85, Cobol experts said. Rather, it is a typical follow-up procedure to resolve ambiguities discovered in writing compilers for the new version of the language.

Once it obtains permission to proceed, the committee will debate what clarifications and corrections to include and then submit them to public review, Schricker said.

The addendum process was initiated shortly after Cobol 85 won final approval Continued on page 15

strategic planning and to support new projects with cost analyses.

"It is very much incumbent on us to find out what is going on and present our view to management," he said.

Jim Everitt, a capacity planner for Weyerhaeuser Co. in Tacoma, Wash., said that in his company, there has been a high level of management acceptance of capacity planning but that the emphasis has been on getting as much performance as possible out of existing systems before choosing new ones.

The traditional role of capacity planner may be weakening, said attendee Les

Czegal, manager of technical support at Toronto Star Newspapers, Ltd. in Toron-

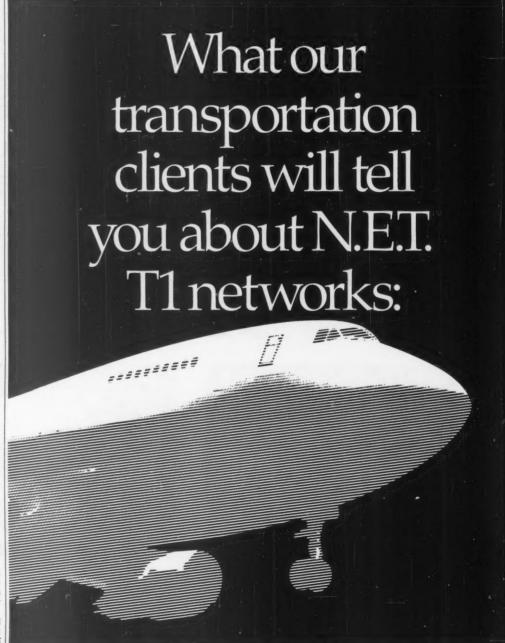
"Things have reached a point where hardware is getting so cheap and immediately available that I think most companies don't see the need to do fantastic plans that aren't going to come about for two or three years," Czegal said. He suggested that capacity planning and performance analysis are moving closer together, with a focus on optimizing performance of existing hardware and software systems.

Phil Vasile, a principal specialist with

McDonnell Douglas Aerospace Information Services in Long Beach, Calif., said capacity planning and performance analysis are growing in his company.

A vendor representative who has been active in CMG said his firm is expanding its management services to help capacity planners communicate better with senior management. Mario Morino, president of Morino Associates, Inc. in Vienna, Va., said his firm plans new courses to help planners effect change and to understand the capabilities they acquire in their work.

"The desire is there to do these things, and certain key users have the wisdom. The problem is that these people aren't salesmen," Morino said. "I'm convinced that most people here have pigeonholed themselves in their organization."



VM, DB2 tools lead charge toward automated DP base

ORLANDO, Fla. — Software vendors claimed progress in their drive toward automated data center operations and expanded their utility offerings, with a focus on IBM's VM and DB2, at the Computer Measurement Group, Inc.'s CMG '87 conference last week.

Boole & Babbage, Inc. renamed its System Manager for IBM's IMS to Autooperator and added support for CICS. The
company claimed that Autooperator is a
step toward automated data center operations because it intercepts operating system, subsystem and monitor messages
and takes corrective steps automatically.
CICS Autooperator works with Boole &

Babbage's CICS Manager. It is available now at \$14,750 for one CPU and \$22,000 for two CPUs at a single site.

Boole & Babbage also announced DASD Advisor, which is an expert system-based extension of the vendor's DASD Response Manager. While DASD Response Manager gathers, monitors and reports data, DASD Advisor assists tuning by identifying problem devices and work loads and recommending solutions in English, the vendor said.

DASD Advisor uses Aion Corp.'s Aion Development System as a shell and can be run as a troubleshooting tool when I/O problems are suspected under IBM's MVS and MVS/XA. Existing DASD Response Manager customers can buy DASD Advisor for \$7,000.

Candle Corp. said it will offer Compucept, Inc.'s Intercept for MVS, CICS and IMS under Candle's Automation Facility product line in January. Intercept was designed to manage console messages and filter out useless ones, which Candle said may represent more than 50% of a system's message traffic.

Candle also entered the DB2 market with a DB2 version of its Omegamon performance management tool. Omegamon previously analyzed DB2 performance only as it affected subsystems like IMS and CICS. Omegamon for DB2 was designed to monitor DB2 externally and warn of problems when user-defined processing limits are exceeded.

Candle enhanced its Omegamon for VM product with a graphics display designed to show how one application impacts the performance of another and to identify problems in resources like CPUs and I/O systems. The enhancement is set to be available in January, free of charge to Omegamon for VM users. The new version will support IBM's CICS/VM, according to the vendor.

Crystal bows

BGS Systems, Inc. added the Crystal Performance Evaluator to its family of analysis tools. The product adds a personal computer interface to let users draw information out of Crystal modeling support libraries. Users can then calculate enduser performance and data processing costs for new applications before committing a design to code. Versions are available for DB2, CICS and IMS.

BGS also announced Bestnet Gateway, which collects performance data from non-IBM systems. The company said the BGS VM Applications Planner, announced during the fall, is now in production. BGS officials said Emcom Corp. and Duquesne Systems, Inc. have agreed to support the network gateway facility.

Softworks, Inc. released VSAM Data Compressor, which was designed to minimize the amount of effort involved in compressing data and reallocating space on disk drives using IBM's VSAM. It includes an analysis program that determines how much space and money a user can save with data compression. VSAM Data Compressor is licensed by IBM CPU classification, with initial CPU license fees ranging from \$18,500 for Group 20 machines to \$29,500 for Group 40 systems.

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Cobo

CONTINUED FROM PAGE 14

from ANSI standard-setting panels in late 1986. The process was intended to allow additions to the language prior to the next full-scale revision of it. The proposed intrinsic functions, primarily trigonometric functions, would be an optional addition, Schricker said. Compiler writers could choose to include or exclude the functions as they saw fit for several years, prior to the next full-scale revision of Cobol.

An optional addendum may become mandatory on the next full-scale revision, depending on what the standard-setting panels decide to include, Schricker said.

The corrections addendum will be a mandatory addition, he said.

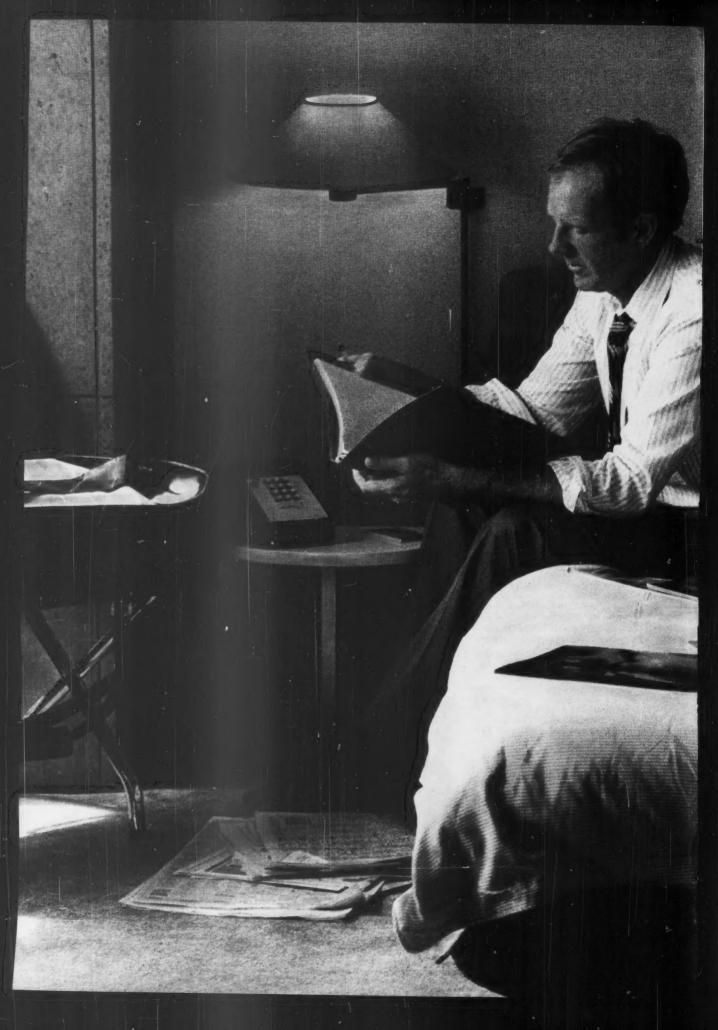
The committee decided to petition its ANSI X3 parent on corrections at a recent meeting in Austin, Texas.

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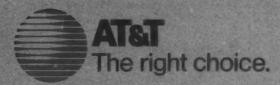
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NAS ties into VAX, eyes science market

BY KATHY CHIN LEONG

SANTA CLARA, Calif. - Intent on seizing a sizable chunk of the \$19 billion engineering scientific market, National Advanced Systems (NAS) last week unveiled its first communications products that will tie its IBM 370-like mainframes to Digital Equipment Corp. VAXs.

Available as part of the new NAS Cross Systems line, the announcements include a set of front-end communications hoards called Nasnet that physically link a NAS mainframe to DEC machines through a Decnet Ethernet network; communications software called Naslink; and Nascompute, a software transport package said to let users write Fortran applications on a DEC system that can later operate on a NAS computer.

While Nasnet and Naslink can be used for general-purpose commercial applications, NAS spokesman Chuck Mulloy said the highest demand for communications tools comes from users in the technical environment.

NAS user Chris Duckenfield of Clemson University in South Carolina said a communications link between IBM-compatible hardware has been needed for a

"In the university environment, we work with a mixture of machines. A NASto-DEC connection will be extremely useful for us," Duckenfield said. "DEC will provide connections into IBM, but IBM will not offer links into DEC. The NAS product would give us the needed connections into DEC." He also said the Nascompute software will be welcome to university developers who create programs on separate machines and cannot transport them to other computer environ-

Nasnet, which routes data and file routing between systems, reportedly lets the NAS AS/XL or AS/VL machines appear as another node resident on Decnet.

Nasnet is sold together with Naslink, which offers file access, data transfer and print listings to and from a DEC VAX/VMS system. Together, the prod-ucts are priced at \$125,000 and will be shipped in the second quarter of next year, according to NAS.

Priced at \$60,000, Nascompute will give VAX Fortran programmers the advantage of running their programs on NAS machines, which NAS said run three to four times faster than DEC computers. The product is set to be available in the third quarter of next year.

The scientific grail
The goal of the products is to give engineering and scientific users the flexibility of moving data from one hardware environment to another, according to Tom Frana, NAS vice-president and general manager for engineering and scientific operations. The products are intended to save users time and spare them the task of moving applications across incompatible architectures, he noted.

The announcements tipped off a NAS strategic focus on penetrating the engineering and scientific community. According to NAS's Mulloy, that segment represents approximately 10% of the firm's customers. Within the next three years, the company intends to bring that figure up to 30%.

While the communications products are the first sold directly by NAS, the company already sells a local-area network-to-IBM Systems Network Architecture gateway that it makes available to OEMs only.

The company is evaluating whether to sell the product directly to customers,

'88 U.S. ship seen for Fujitsu drives

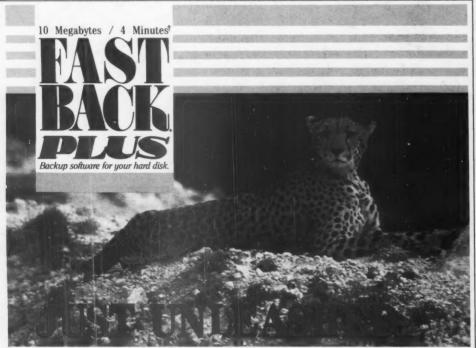
TOKYO - Fujitsu Ltd. last week introduced 7.56G- and 2.52G-byte hard disk drives called the Facom 6425H and the Facom 6425G, respectively.

Although Fujitsu did not specify when the products will be shipped overseas, industry watchers predicted the company will start OEM shipments between April and June next year in anticipation of the expected announcement of IBM's 3990 controller next fall.

The disk drives feature a 3M bit/sec. data-transfer rate. The Facom 6425H and the Facom 6425G offer average access times of 24.3 and 20.3 msec, respectively, and both work with the company's IBM-compatible M series mainframe and VP series supercomputers.

Fuitsu said it boosted track density 12%, compared with its existing 5G-byte hard disk drive models. Monthly rental fees are set at the equivalent of \$5,555 for the Facom 6425H and \$3,185 for the Facom 6425G, with domestic shipments scheduled to begin at year's end.

The firm also added a file control sys-tem, called the Facom 1700A, that features a 4M-byte memory and four paths to write and read data. It reportedly will lease for the equivalent of \$2,370 begin-



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SSST... THERE'S A nefarious crook operating within your MIS shop.

It appears to be an applications programmer. Or maybe someone in data base administration. Actually, it's looking more like that guy in data entry whose girlfriend got canned last month. On second thought, maybe he is not within your midst at all. Maybe it's an outsider. Somebody with burglary tools as sophisticated as a \$1,500 personal computer, a telephone and a modem.

One thing's fairly certain: If a crime in your shop is, in fact, committed, perhaps the greatest effort to follow will be in covering it up, because the news of a systems security breach can be damaging to a company's image.

As this week's Executive Report, beginning on page 73, points out, getting a handle on systems security is reminiscent of the plight of the poor groundskeeper played by Bill Murray in Caddyshack.

He tried nine ways to Sunday to unobtrusively rid the golf course of a pesky groundhog, his patient efforts finally giving way to dynamiting the links and still failing to uncover the pest.

The scope of the systems security issue is best illustrated by considering that anyone you speak with who has worked within a systems environment can very likely document a breach of security of which they've been aware.

For the most part, these breaches appear more as annoyances than serious threats to the organization.

But, as the report notes, the right mixture of inadequate systems security and evil intent can produce costly disasters, having immediate cost ramifications (as in the case of Volkswagen AG) as well as potential loss of consumer or customer confidence.

Undermining efforts to build more secure systems is the difficulty in selling the cost of doing so to upper management. Increasingly, chief financial officers are approving only expenditures and capital outlays that yield a quantifiable improvement in information systems efficiency. But installing adequate security measures, which can be costly, generally cannot be costjustified the way a new payroll system can.

So, as one consultant suggested, put the value of enhanced security in terms chief financial officers can understand, such as how much money is likely to be lost in a security breach.

Be aware, too, that some systems appear to be more "breachable" these days than others. Unix-based systems are cropping up as likely targets for hackers, although this fact is prompting accelerated efforts to tighten up that operating system environment.

Ultimately, MIS must perform a balancing act between security — and its costs — and access to data, which is becoming a foremost demand as end-user computing proliferates.



Itom: U.S. software firms hire private eyes to crack down on Hong Kong software pirates.

LETTERS TO THE EDITOR

Another angle

In Fred Viskovich's article "What threatens mainframe computing?" [CW, Oct. 19], he argued that mainframe computing is a paradigm like the paradigms of scientific thought described by Thomas Kuhn in The Structure of Scientific Revolutions.

A paradigm in this technical sense is a set of presuppositions that forms the background for thought and debate in some area or discipline but is not the subject of rational thought or debate. As Kuhn remarked, one paradigm is abandoned for another not when it succumbs to the superior rational merits of its successor but when those in power who support it either die or retire.

The two letters that have already appeared in response to Viskovich's article have unwittingly confirmed his thesis. Joseph Vincent [CW, Nov. 9] sneered openly at Viskovich's conclusions. David Dick [CW, Nov. 16] attributed to Viskovich the absurd conclusion that an IBM Personal System/2 Model 30 is, without any qualification, equivalent to an IBM 4381 Model 12 — an attribution difficult to justify even after a very unsympathetic reading of the arti-

If this is the best mainframe defenders can do against Viskovich, then perhaps he has uncovered a paradigm to which commitment is more emotional than rational.

At the risk of further confirming the thesis about mainframe computing as a nonrational issue, I will suggest that, given current technology, there is one reason why peer-to-peer net-works of PS/2 machines are not

about to replace mainframes for complex, intensive corporate computing tasks any time soon.

The property of shared-memory computer systems, sometimes referred to as space-time coherence, allows a single operating system in control of such a computing complex to determine the status of each processor in that complex in order to allocate system resources efficiently based on this information. Distributed systems, lacking shared memory, must instead rely on polling and mes-sage-based communications to determine the state of the entire computing complex, because this kind of communication is terribly slow compared with the speed of the processors themselves. By the time information

This week in history

Dec. 12, 1977
President Carter forms a commission to deal with the problems created by large antitrust cases such as those involving IBM and AT&T. The commission will work from the assumption that the antitrust laws are what they should be, but better procedures to expedite their denouement need to be developed.

Dec. 13, 1982
Burroughs Corp. unveils its
largest computer system to
date — the B7900 — which
reportedly boasts up to 16
times more memory than the
firm's previous top-of-theline processor, the B7800.

about the state of each processor has been collected at a single point of control, these processors have gone on to new states, thus rendering the information useless as a basis for making decisions. Clearly, a typical commercial mainframe computer, as a shared-memory system, has the property of space-time coherence and can therefore make use of available system resources such as processors and memory much more quickly and efficiently in carrying out large, intensive computing tasks than a distributed system of otherwise comparable capabilities can.

None of this really argues against Viskovich's conclusion about the inessentiality of mainframe computers to serious corporate computing, however, unless technological progress somehow stalls short of producing interprocessor communication speeds approaching the speeds of the processors themselves. The lack of space-time coherence in distributed systems is a function of available technology for interconnecting the processors they comprise, and this technology is hardly standing still. Viskovich may have been correct in suggesting that IBM's PS/2 Micro Channel is a milestone along the way.

John Seefeldt

John Seefeldt Director Bureau of Information Services Pennsylvania Treasury Department Harrisburg, Pa.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

the same language?

Vendors must emphasize more than technical excellence to sell their products' benefits to MIS

EFREM MALLACH



Suppose a vendor appears in an MIS director's office and proudly says, "I can cut vour staff's program-

ming time in half across the board." Should the MIS director throw him out? Of course not. But MIS directors do throw him out every day.

The vendor is probably selling fourth-generation programming languages. Their productivity benefits are unquestioned. A factor-of-two productivity increase is a conservative assessment: some observers estimate a factor of five or 10. Resource utilization is less of a problem than it once was: the languages have improved, and MIPS are

The resistance of MIS profes-

Mallach is a faculty member of the Boo ton College School of Management and a consultant to user and vendor executives, Based in Needham, Mass., he recently published Win Them Over: A Survival Guide for Corporate Consultant Relations Programs.

sionals remains, however. The reason is that the real objections to fourth-generation languages have little or nothing to do with their merits. Technical objections may be raised to cloud an issue, to snow nontechnical executives or to create an aura of scientific objectivity, but they are seldom the heart of the mat-The resistance is often based on personal factors.

Impressive, but . .

To be sure, productivity gains of 50% look impressive, but the real gain depends on the follow-

Time on the job. How long does a programmer stay on a project before finishing the task, moving to a different one, resigning, being promoted to management, transferring to enduser support, becoming a systems analyst or otherwise leaving that specific task? On the average, no more than 12

Amount of time on the job spent programming. Defining requirements, designing files, planning algorithms, documenting screen layouts, training end

Continued on page 22

4GLs: Are we talking | Toward a new global economy

The U.S. must foster collective entrepreneurialism to remain competitive

IOHN KIRKLEY

Sometimes it seems that almost everything not nailed down is being bought by foreign investors. For a while it was the OPEC nations, now the Japanese, the English and the French.

As our balance of trade droops deeper into deficit, as the stock market swoops and slides, as the newly industrialized countries like Korea, Singapore and Taiwan keep nipping at our heels with higher productivity and lower prices, as our leaders in Washington, D.C., keep stepping on their tongues, seemingly in-capable of dealing with an econo-

my in dishabille, as foreign countries buy up our corporations and real estate. there are those who are throwing up their hands and consigning the U.S. to a slow decline to thirdrate status in the

However, a few see some light in the deepening economic gloom. John Young. chief executive officer of Hewlett-Packard Co. and chairman of the President's Com on Industrial Competitiveness, told attendees at the fall Seybold Executive

Forum that a new, redoubled striving for quality can bring our industries back into the competitive ball game.

Young called for total quality control within businesses, not just in the manufacturing and production areas, but at every level of the organization, from the janitorial staff to the executive boardroom. He urged U.S. companies to begin thinking of the global marketplaces, noting that fewer than 100 firms in this country produce more than 80%

Hunkering down

of the exports.

To those who want to hunker down, tighten their belts and adopt a survivor mentality, Young said that the worst thing we could do would be scale down our efforts. He commented that the U.S. is still by far the world's technological leader and urged us to bring the same expertise and energy to the rest of the product cycle - to develop, market and distribute our wares with the same Yankee ingenuity

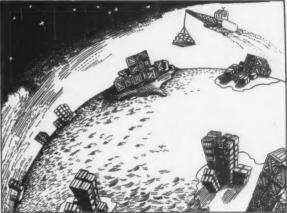
Kirkley is an industry consultant currently acting as editorial adviser to Patricia Sevbold's Office Systems Group. He is based in South Nyack, N.Y.

that we bring to our product con-

Young was followed on the podium by the irreverent Robert Reich, an economist from Har-University's Kennedy School of Government and author of the best-seller. The Next

Reich was very serious, how-ever, when he asked how the ss community could be competitive in the world's markets when 22% of our children are living below the poverty line, the highest number in 18 years: 30% of 18-year-olds do not finish high school and, of these, 20% are functionally illiterate; and older industrial economies have two options: They can try to match the wages for which workers elsewhere are willing to labor; or they can compete on the basis of how quickly and well they can transform ideas into incrementally better products.'

A different approach
This second and obviously more appealing option implies a fundamentally different approach to the notion of entrepreneurialism. Instead of a few lone entrepreneurs producing a few industry-making Big Ideas, innovation must become more continuous and collective.



Big Blue as the customer

STANLEY GIBSON



For IBM, 1987 may have been the year of the customer, but 1988 could well be the year in which IBM be-

comes the customer.

IBM recently acknowledged that it is trying a policy in which it acts as a point of reference for all of the maintenance in a data center. If your Memorex Corp. disk

drive breaks, you call IBM. IBM in turn notifies Memorex. In this way, a customer doesn't have to worry about who to call when something goes down. IBM does

This maintenance move has caused some operations manag-

ers to speculate that IBM may go one step farther and take over the running of data centers com-

Ridiculous? Yes — particularly when the IBM sales representative calls on an IBM data center manager.

"Hi, Bob Williams?" Yes?

"This is Bill Roberts from IBM. Just thought I'd stop by to see how everything was going. Beautiful day, isn't it? Say, nice suit. You don't see too many MIS execs who know how to dress. By the way, I thought I'd tell you about a special limited-time offer we have to upgrade your communications controllers."

"Nice try, Roberts, but you know how tight budgets are at the end of the year. Besides, you did such a good job of selling equipment to the guy that used to work here that upper management's put a freeze on new pur-

"Yes, of course, but maybe the senior V.P. would be up for a game of golf to talk it over. Have you thought of adding some memory to your CPU to boost your DB2 performance?'

'Nope. But since you're here, maybe you IBM guys would like Continued on page 22 70% of new Ph.D.s did not go to work on new commercial products or corporate research and development in 1986 but instead were engaged, either directly or indirectly, on military projects.

er entrepreneurs'

Of all the research and development in the private sector, 35% is paid for by the government, Reich said, and 80% of that is paid for by the Pentagon. He bemoaned the fact that his brightest students were not heading for marketing, sales or other corporate jobs but were instead looking toward Wall Street to become "paper entrepreneurs."

In his new book, Tales of a New America, Reich notes that in the past, companies searched for what he calls "The Big Ideas." Once the hot new products were brought to market, they followed a predictable life cycle and were finally discarded to make way for the next Big

"In the new global economy," Reich writes, "nearly everyone has access to Big Ideas (and the machines and money to turn them into standardized products) at about the same time and on roughly the same terms. The

Products no longer follow a preordained life cycle; instead they evolve. Vacuum-tube radibecome transistor radios, then portable earphone radios, then compact disks and then optical-disk computer memories.

'This pattern of ongoing, incremental evolution depends on the cumulative expertise of a great number of people," says. He stresses the role workers play: They "add value, not solely or even mostly by tending the machines and carrying out routines, but in the analysis, experimentation and the application of creativity."

In contrast, today's business environment, which supports and rewards individual opportunism, has led to the era of the corporate raider, the Wall Street scandals and worse, the rise of a whole new class of individuals who "get paid for rearranging economic assets rather than enhancing their value," Reich says.

"The new reality of global competition," as Young called it, is the rallying cry for U.S. business. Can we find new ways to compete in the world's markets? Can we make the label "Made in the U.S.A." synonymous with

Continued on page 22

Gibson is a Computerworld senior

DECEMBER 14, 1987

4GLs

CONTINUED FROM PAGE 21

users, going to meetings, taking vacation, holiday and sick time and so on means that, at best, half of a person's time on the job — or six months — is spent actually programming.

So cutting programming time by 50% will save three months work.

The time it takes to learn a fourth-generation language. These languages are not standardized. There are few applicant pools for any given one of them. Usage skills in one language are not directly transferable to another language. If it takes a programmer three months to become proficient with a

fourth-generation language, the productivity gain is gone; more than three months results in a net loss.

Applicants experienced in Cobol or other widely used, standardized languages have been told for years to nurture these valuable skills. They have been rewarded for them and know that programmers with these skills are always in demand.

Should they risk a career detour because a silver-tongued dreamspinner intones, "Fourth-generation languages are the future?"

Future values

Programmers face a more severe psychological crisis. The same manager who sent them to CICS Cobol class last year

now wants people who know Focus! What does this change say to the current staff about the future value of their skills to their employer?

Revolutions have been started over much less.

Meanwhile, fourth-generation language vendors are doing the following wrong things:

 They are improving efficiency. There's certainly nothing wrong with efficiency, but it's not the real issue.

• They are adding features

• They are competing on the basis of "We have 10 numeric data types, and the other guys only have six." That's not where it's at either.

What should vendors of fourth-generation languages do? • Sell to the upper MIS executives. The payoff of fourth-generation languages is greater over their longer-term horizon.

 Promote standardization. Don't squabble over percentage points of the pie; ex-

pand the pie.

 Reassure programmers that their essential skills are language-independent. A fourth-generation language lets them express ideas and implement concepts more quickly.

• Provide transition help. Most courses and manuals start from an elementary, neutral position. There is a need for training and documentation that respect students' or readers' existing expertise using terminology they are familiar with explaining by analogy to Cobol concepts, for example.

Technical excellence has seldom been the key to marketplace success in mainstream commercial data processing. Fourth-generation languages are already technically adequate, but technical merit can't be the main selling point to get that language into the DP shop.

Customer

CONTINUED FROM PAGE 21

to take a few of these old 3084s off my hands. We can sell used equipment now, you know, and if there's one thing I've got around here, it's used equipment. Say, nice tie. Not too loud; I like that in a salesman."

"Thanks, but you want me to buy from

"That's right. Hey, IBM is built on sales. In our high rise, I've got 20 floors of personal computers that we can't use anymore because you sold the previous guys on replacing them all with PS/2s. Take them all, Roberts, and you don't have to pay us for six months."

"How about a new 3090, and you don't have to pay for a year? I've got a quota to

"Maybe. I'll be transferred by then anyway. The guys upstairs in accounting won't see the bill till I'm gone."

"So it's a deal?"

"OK, OK, but there's just one thing. Will you take those used PCs off my hands or not? I may work in a data center, but I've got a quota to make, too. I'm still short of the 100% Club, and I'm sitting on a big building full of old equipment."

"Sorry. If you want to make your quota, try this; it works every time: Call a third-party maintenance company to handle service. Then keep calling them in the middle of the night to come fix your machines. They'll have to pay our parts center \$250 per part after hours. That'll add up pretty soon."

Economy

CONTINUED FROM PAGE 21

the very finest in quality workmanship? Can we make new ideas like collective entrepreneurialism part of the fabric of our corporate life? Do we have the vision and the collective will as a nation to adopt the social and educational programs and reforms that are so desperately needed?

If we do not heed the words of people like John Young and Robert Reich and institute major changes in the way we do business now, our eventual rallying round the flag may be too little too late.



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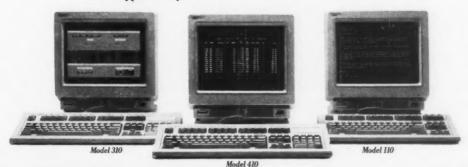
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SOFTWARE & SERVICES

SOFT TALK

Howard Fosdick

VM's coming of age



After a slow start. VM is booming. While pub lished growth rates for the op-

erating system vary, most analysts place its growth at between 30% and 50% per year. VM will surpass DOS/VSE this year as IBM's most widely installed main-

frame operating system. It's clear that VM has moved out of the backwater and into the mainstream - and this is the operating system that an MVS development group within IBM once recommended against taking to market. (Legend has it that management later noticed that the group used VM for its own software development.) VM is IBM's primary system for office automation, departmental computing, distributed computing and the information center. It is increasingly accepted for business process ing, even though it remains weak in transaction processing.

VM's popularity is rooted in its technical strengths. Premier among these is VM's interactive orientation. With its teleprocessing monitor, CMS, VM supports roughly double the number of interactive users

Continued on page 30

U.S., UK team up for study

Cost-cutting among reasons experts will research software maintenance

BY CHARLES BABCOCK

ARLINGTON, Va. - U.S. and British experts on software maintenance are planning common methods for surveying managers in software maintenance to collect fresh data on the sparsely researched field.

The information will be fed to a study group at the Center for Software Maintenance at the University of Durham in England, one of the few academic sites devoted to the subject. British Telecom, the UK's largest telephone company, will participate in the survey and cosponsor it in the UK.

In the U.S., the Federal Software Management Support Center, a branch of the U.S. General Services Administration in Falls Church, Va., wants to conduct an independent survey that could also produce data for the center. The two parties are defining terms and discussing questions that they agree need to be

Little done in past Experts on both sides of the Atlantic said there is little research on how to measure program size and complexity, how to measure productivity among mainte-nance programmers or what diagnostics and tools aid the maintenance effort.

Richard Harrison, director of the Federal Software Management Support Center, said no ef-

fective survey has been conducted since the pioneering work of Lientz and Swanson at the University of Southern California, which was published in the early 1980s.

Citing a desire to cut rising maintenance expenses in the federal government, Harrison noted that there are few measures of maintenance program-mer productivity or definition of what their problems are.

The Lientz and Swanson studies shed little light on these issues. "Their central conclusion was that we are spending a lot of money on maintenance. Until they did their work, it wasn't largely recognized that maintenance was a necessary func-Continued on page 30

Intelligent controller offered

BY ALAN ALPER

HACKENSACK, N.J. - Syllogy Corp. is offering an intelligent controller for IBM's OS/VS Cobol compiler that can significantly reduce the CPU cycles consumed in compiling a Cobol application.

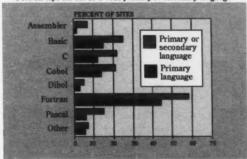
The program, called Cobol Express, allows the OS/VS compiler to compile many in-changes rather than every inpiler to compile individual struction in an application. provide an intelligent controller for the compiler so it does the minimum amount of work required," noted Stan Rintel, Syllogy's president and cofounder.

Cobol Express works in parallel with OS/VS, directing the compiler to which instructions need to be updated, Rintel said. 'The compiler and Express both reside in the library and work together without modification," he said.

Continued on page 31

Data View

VAX programming languages Fortran tops the list as a VAX primary or secondary language



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

ADR extends system to VM

BY ROSEMARY HAMILTON

PRINCETON, NJ. - Applied Data Research, Inc. (ADR) recently released a version of its change control system that will run in the IBM VM and ISPF en-

ADR/The Librarian Release 3.7 manages the updates of source code programs in order to reduce programming errors, the vendor said.

By controlling the movement Continued on page 28

Inside

• Digital Information offers utilities for DBL language. Page 28.

Venturcom rolls out OA tools for Prelude 4GL. Page

 Interleaf reconfigures TPS publishing software. Page 34.

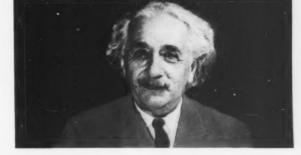
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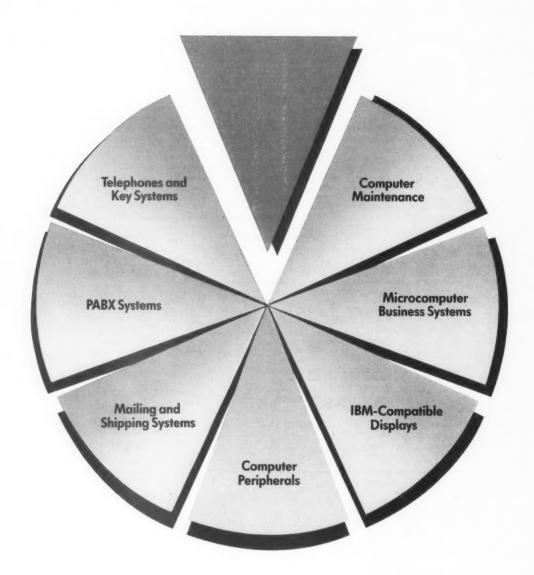
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Firm develops tools for use with Dibol

Digital Information Systems' DBL Synergy utilities do windows under MS-DOS, VAX/VMS

BY SUZANNE WEIXEL

RANCHO CORDOVA, Calif. - The first in a series of utilities designed for use with a version of the ANSI-standard Dibol business programming language is now available from Digital Information Systems Corp.

Dibol was developed by Digital Equipment Corp. for use on its VAX computer

DBL is a version of Dibol developed by

Digital Information Systems. The DBL Synergy utilities are intended to further enhance the DBL language, the company

The first utility in DBL Synergy is a windowing tool that provides the developer with the flexibility to open up to 256 windows on the screen at one time, the company said.

The windowing capability was designed to simplify the display of menus and Help screens and to provide a consistent appearance in applications.

Kevin Curry, a senior programming analyst at Agena Corp. in Columbus, Ohio, said he has used DBL for three

"DBL Synergy requires very little code for creating, maintaining and updating windows. It is also portable across the different operating systems we use, Curry noted.

Originally, Curry said, Agena had considered writing its own windowing tool but found that it required too much manpower and too much code.

Digital Information Systems said it in-tends to add other utilities to DBL Synergy, including an interface to relational data base management systems such as Unify, Inc.'s Unify; a data dictionary; a re-

port generator; and a Make utility.

DBL Synergy is currently available.

Prices start at \$489 under Microsoft Corp.'s MS-DOS and go to \$1,289 on the

DBL costs from \$589 under MS-DOS to \$7,889 on VAX machines, Digital Information Systems said.

A structured language According to Michele C. Wong, executive vice-president of Digital Information Systems, DBL is more structured than other languages, such as Cobol.

DBL includes structured programming, a debugging facility, program binding, virtual memory, sort and merge statements and multidimensional arrays,

BL SYNERGY requires very little code for creating, maintaining and updating windows. It is also portable across the different operating systems we use."

> **KEVIN CURRY** AGENA CORP.

according to Wong.

DBL is also able to compile standard Dibol code, the company said.

DBL, which can be ported to a variety of operating systems including MS-DOS, DEC's VAX/VMS, Unix and Novell, Inc.'s Netware, was originally released 10 years ago, Wong said.

Approximately 15,000 licenses have been sold.

ADR

CONTINUED FROM PAGE 25

of source code from test to production environments, the change control system lessens the chances of programmers' revising modules in unexpected ways or changing modules that have already been updated, according to ADR.

Sharing Librarian possible

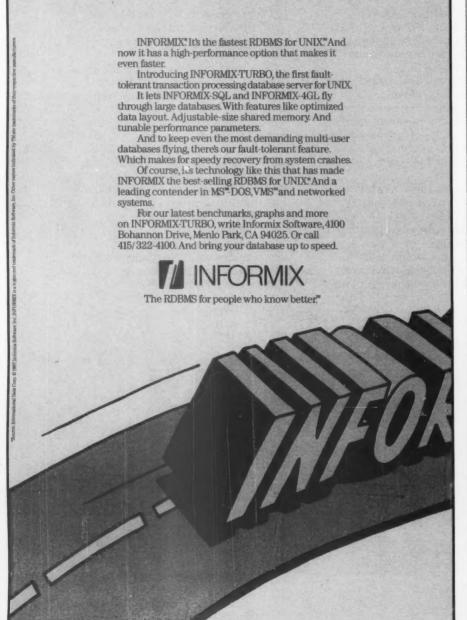
The system has been offered for IBM's VSE and MVS environments. With the new release, sites will be able to share Librarian master files across IBM operating systems. ADR said.

The additional support of ISPF gives use access to IBM's dialogue management service for the MVS and VM environments.

ISPF is most often used by application programmers to develop interactive applications with menus and other end-user

ADR/The Librarian Release 3.7 includes an updated version of Comparator II, a Librarian component for the MVS environment that allows comparisons of records that are of fixed or variable length, the company said.

Permanent licenses for ADR/The Librarian Release 3.7 are \$25,000 for VSE and VM users and \$59,900 for MVS users. ADR said.



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Fosdick

CONTINUED FROM PAGE 25

that can be supported by TSO at an MVS site with an equivalent machine.

Unlike TSO, which was added onto a batch processing operating system, CMS was specifically designed for interactive computing. It's widely considered IBM's easiest-to-use mainframe teleprocess ing monitor.

CMS also features exceptional software development facilities. The VM/CMS environment can be tailored to the individual programmer's needs, allowing a programmer to request the amount of memory needed, tailor the editor to the task and utilize the terminal as

a virtual operating system console. VM's REXX command procedure language allows the programmer to invoke operating system commands from within a REXX program. The REXX command set is so powerful that it was included in IBM's Systems Application Architecture rather than command languages from the MVS or VSE environments.

In addition to these strengths, programmers may develop code for MVS and VSE systems as well as VM under CMS. And programmers can test code for remote sites on a local host. In an era of distributed computing and programmer workstations, these capabilities give VM/CMS an increasingly critical role.

VM's unique characteristic is its ability to act as a "hypervisor" - an operating system that runs other operating systems. It achieves this by "virtualizing" computer resources, making it appear to each guest operating system that it alone controls the real computer.

The coresidency of several operating systems on a single machine strongly appeals to customers supporting multiple operating systems. One machine supports testing, conversions and reconfiguration of operating systems. Even sites with a single mainframe gain the advantages of diverse operating systems. For example, companies running DOS/VSE under VM reap the interactive benefits of CMS while retaining the production strengths of VSE. VSE is estimated to run at 90% of its capacity under VM vs. stand-alone operation.

Another VM advantage is that it requires fewer systems programmers than other mainframe operating systems. This is critical to the many smaller companies running 4300s and especially the newer 9370s, since these sites can't afford systems expertise. As VM has achieved market success, IBM has adjusted its software strategies accordingly First, one should recognize that IBM has propagated VM/CMS across its comput-

The presence of a single CMS monitor across machines of different sizes also means that programs and programmer skills are transferable.

VM/CMS represents IBM's answer to critics who begrudge the company its diverse hardware and software offer ings. While DEC runs a single operating system on all its machines, smallest through largest, IBM can now make that same claim. And while Unix afficionados claim applications portability and skills transferability across machines of any size, IBM matches that claim through

Fosdick is an industry analyst in Villa Park, Ill., and author of VM/CMS Handbook: For Programmers, Users and Managers.

U.S., UK study CONTINUED FROM PAGE 25

tion," Harrison said.

The federal Office of Management and Budget (OMB), attempting to put a lid on rising maintenance costs, issued a directive in July 1986 that maintenance expenses were to be cut 25% during the next three years.

The author of the directive, Franklin S. Reeder, attended the Data Processing Management Association's conference two weeks ago and answered, "We don't know," when asked how OMB planned to measure whether software maintenance groups were living up to the directive.

'Little desire to analyze'

"In federal systems, it has not been difficult to generate money for new systems. There's been little desire to analyze what's wrong with existing systems and squeeze more productivity out of them,' Harrison noted.

'We know we're spending a lot of money on maintenance. We don't know where it's going exactly," said John Foster, head of the software engineering applications group for British Telecom.

Harrison, Foster, Mel A. Colter, a software maintenance author and consultant with Colter Enterprises, Inc., in Monument, Colo., and Keith Bennett, director of computer science at the University of Durham, are working together to hammer out common definitions and approaches for a survey on each side of the Atlantic. They do not plan to do exactly the same questionnaire. Rather, they want to collect data that both sides can agree that they know what it means.

The group is seeking commercial companies in the U.S. and UK that wish to participate in the survey. Anyone interested should contact Foster at British Telecom, Research Laboratories, Martlesham Heath, Ipswich IP5 7RE.

The surveys on maintenance are also being advocated by Colter, who gave the keynote address at the DPMA's 5th annual conference last month.

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Intelligent

CONTINUED FROM PAGE 25

Since compiling can consume about 20% of a CPU's capacity, a large reduction in compile time, such as the 75% reported by one Cobol Express user, may boost effective machine capacity by 15%, Rintel said.

The product operates on any IBM mainframe or equivalent running IBM's MVS/370, MVS/XA or VM/CMS operating systems. It supports all Cobol pre-processors, such as CICS; post-processors, such as Computer Associates International, Inc.'s CA-Optimizer; and source code storage products, such as Pansophic Software, Inc.'s Panvalet and Applied Data Research, Inc.'s Librarian. Cobol Express is priced at \$3,200 per processor per year for a three-year license.

Cobol Express has already been installed at 10 sites, Rintel said, including Bank Leumi Trust Co. of New York and Reader's Digest Association, Inc. in Pleasantville, N.Y. Installations using Cobol Express have projected cost savings of between \$65,000 and \$210,000, depending on the extent of Cobol development and maintenance and internal charge-back rates, Syllogy said.

Bank Leumi is using Cobol Express with its IBM 4341 Group 2 running under MVS/SP. The system is used primarily for development, so a good deal of CPU resources are consumed by recompiling as programmers test their code, noted Harry Adler, project manager in charge of operating systems.

Before Cobol Express was installed, compiling used 55.3% of computer time, 61% of execute channel programs — better known as I/Os — and 55% of service units. When using Cobol Express, there was a 72% improvement in computer time, a 73% reduction in execute channel programs and a 67.5% savings in service units, Bank Leumi reported. Cobol programs with 20,000 to 30,000 lines are now done in 20 minutes, down from almost two hours previously.

'Helps a great deal'

"With all the compiles we do, cutting down the time to 20 minutes helps us a great deal," Adler asserted. "If a person has a problem, he fixes it and recompiles quickly. It doesn't lock out the rest of people who need to do recompiles."

Sal Costenzo, assistant director of data processing technical services at Reader's Digest, has been using Cobol Express on the firm's IBM 3090 Model 400E running MVS/XA for the last year. The firm runs about 1,000 batch jobs daily to update customer files, he said. Cobol Express produced savings when compiling for the first time as well as in recompiling, with gains of 40% to 80%, Costenzo said. "When you recompile, it ranged from 40% to 80% savings; you're talking about an average of a 58% reduction in computer resources," he said.

Currently, Cobol Express does not support VS Cobol II — IBM's latest Cobol compiler — although Syllogy's Rintel said he is negotiating with IBM to license the source code. The problem, Rintel pointed out, is IBM's policy of providing only object code to independent companies.

"They have to determine the value of the code and make a procedural change," Rintel said. "So far, they've said yes, that it makes sense for both companies."

OA tools aimed at Prelude 4GL

BY SUZANNE WEIXEL

CAMBRIDGE, Mass. — Venturcom, Inc. introduced a set of office automation productivity tools for use with its Prelude fourth-generation language and relational data base management system.

According to a company spokesman, the Prelude Office Information System allows office automation applications to be developed with a common user interface. It can also extend the interface across existing third-party applications.

Designed as a series of integrated modules, the applications available in-

clude spreadsheets, graphics, word processing, calendar and project management. All modules use a common set of menus, screen formats and keystrokes. The modules can also work independently, the vendor said.

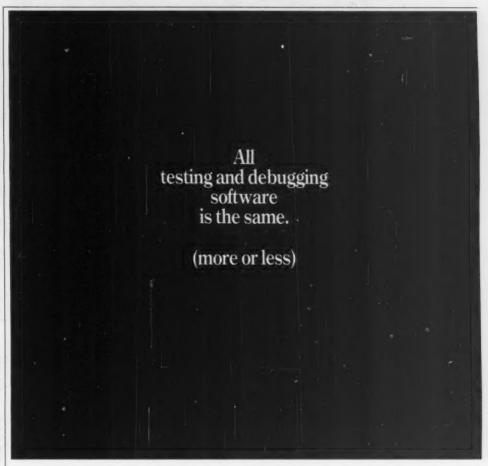
The Office Information System supports data transfer between applications, electronic mail between users, multitasking and user customization. Screen layouts are uniformly based around a Lotus Development, Inc. 1-2-3-type menu, and context-sensitive help and error indicators appear as pop-up windows within an application.

The Prelude fourth-generation lan-

guage development facility contains a forms builder and report writer as well as a screenshell and a data manipulation language. The Prelude relational data base maintains concurrency control and supports administrative tasks in addition to providing access to data base tables.

The Prelude Office Information System, priced at \$1,995, is currently available on the IBM Personal Computer AT and compatibles and the AT&T 3B line of computers, the vendor said.

Prelude runs under Unix System V or Venturcom's Venix, a version of the standard Unix System V. Venix costs from \$400 on a PC AT to \$15,800 on a Digital Equipment Corp. VAX 8600. Prelude has an installed base of more than 3,000 units, the vendor said.



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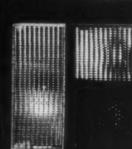
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Applications packages

Interleaf. Inc. has announced a reconfiguration of its TPS publishing software into a core text-and-graphics product and two sets of bundled options.

TPS provides word processing, automatic page layout, graphics and imaging and long-document management capabilities. The core version was designed as a networked product.

The advanced graphics option provides diagramming capabilities such as isometric conversions and line-art imaging. The document management option produces long, multichapter documents

TPS runs on workstations from IBM; Apollo Computer, Inc.: Digital Equipment Corp.; and Sun Microsystems, Inc. as well as on Apple Computer, Inc.'s Macintosh

TPS costs \$12,500. Core TPS costs \$6,500. The options cost \$4,000 each. Interleaf, Ten Canal Park, Cambridge, Mass 02141 617-577-9800

Utilities

A support package for running AT&T's Ditroff software under the Digital Equipment Corp. VAX/VMS operating system has been announced by Talaris Systems, Inc.

The package, called Ditroff-Sup-port-VMS, lets VAX/VMS users print documents typeset using Ditroff on Talaris Quic-based laser printers. It includes the Ditroff software, sublicensed from AT&T; the Documentor's Workbench; 120 Ditroff fonts in portrait and landscape orientation; and documentation.

Ditroff-Support-VMS is priced at \$1,950

Talaris Systems, P.O. Box 261580, San Diego, Calif. 92126, 619-587-0787.

Services

A disaster recovery planning guide called Contingency Planning

gies/90 has been announced by Contingency Planning Research, Inc.

The guide is said to provide the information necessary for companies to develop business resumption plans. It includes document restoration strategies, hot-site locations, planning for the loss of employees, data center relocation planning and simulation strategies.

Contingency Planning Strategies/90 is intended for sites that use systems like IBM's System/38, 9370, 4300 and 3000; Data General Corp.'s MV series; Digital Equipment Corp.'s VAX; Unisys Corp. systems; Wang Laboratories, Inc.'s VS/7100; and the NCR Corp. 9000. The

guide costs \$125 per copy.
Contingency Planning Research, P.O. Box 568, Glenwood Landing, N.Y. 11547, 516-754-7087.

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NEW AT DEXPO WEST 187

Quantum PM, real-time performancemonitoring software for Digital Equipment Corp. VAX systems, was announced by Computer Information Systems,

Quantum PM is said to collect and re-port configuration, CPU, I/O and memory statistics for performance analysis, system tuning and capacity planning. It collects statistics directly from DEC's VMS. According to the vendor, the system manager can define, adjust, modify and delete statistic groups used in collecting and reporting data.

Pricing ranges from \$1,000 to \$54,000, depending on system configuration. Computer Information Systems, 165 Bay State Drive, Braintree, Mass. 02184.617-848-7515.

MCBA, Inc. released its Labor Performance software package for VAX computers.

Part of MCBA's Manufacturing System in VAX Cobol, the package supports clock-card entry and editing. Other features include the ability to use files created by data terminals; analyze performance productivity; support reporting by department crew or work center; centralize labor transaction entry; support an incentive system; support multiple compaes; and interface with other packages in MCBA's Manufacturing System.

The Labor Performance package costs from \$4,000 to \$7,500. MCBA, 425 W. Broadway, Glendale, Calif. 91204. 818-242-9600.

Pacershare, software that enables any VAX/VMS system to function as an Apple Computer, Inc. Appleshare-compatible file server, was introduced by Pacer Software, Inc.

The software implements the Apple Filing Protocol on a VAX system, enabling the VAX to act as a large file server for an Apple Macintosh network. The Macintosh mouse and graphics interface can be used to peruse the VMS file system, create directories, move directory trees or access any VME file type from within a standard Macintosh application.

Pacershare requires Pacer's PClink communication software installed on the VAX. The Macintoshes must be connect-

Supporting five concurrent users on a DEC Microvax, PClink costs \$2,000, and Pacershare costs \$400. Pacer, Suite 402, 7911 Herschel Ave., La Jolla, Calif. 92037. 619-454-0565.

MICROCOMPUTING



No Dbase IV for Christmas



Hold that check. It's going to be a hurtin' Christmas for Ashton-Tate's Glendale, Calif -based

Dbase IV development team. It seems that Ashton-Tate management offered the team a bonus totaling \$2 million - if it could polish up Dbase IV and get it to market before the end of the year. According to an Ashton-Tate source, the team only made it to an alpha-test version, so no \$2 million. Anybody want to assume payments on an almost-new Porsche?

This is Dbasically it. Users interested in the still-unfinished Dbase IV can catch a glimpse of the alpha-test version at the Dec. 15 meeting of the Dbase Special Interest Group of the NYPC Users Group, a Dbased source said recently.

You're Dbasically hired. Ashton-Tate has added Moshe M. Zloof to its development staff as senior scientist in charge of software development. Zloof will be responsible for advanced user interfaces for data hase anplications development.

According to Ashton-Tate, Continued on page 40

Buyers skirt clone service woes

Users discover imaginitive ways to support low-cost units

BY ALAN J. RYAN

Once snubbed by big businesses, low-priced IBM Personal Computer clones are making their way onto corporate America's desk tops with the help of some innovative approaches to ser-

While many business buyers now publicly boast of purchasing two clones for the price of one IBM or Compaq Computer Corp. machine, they also point out that there is a trade-off in availability and ease of service. However, new service programs are softening some of their apprehensions

The manager of end-user support at a major oil company said his firm has purchased approximately 280 PC's Limited personal computers from Dell Computer Corp. in Austin, Texas, at a savings of 40% over comparably equipped IBM offerings. Honeywell Bull, Inc. representatives service the units.

Carol Kellogg, assistant viceresident of marketing systems at Mony Financial Services Co. in Teaneck, N.J., said she is recommending a low-profile clone to her company's 3,000 field sales representatives.

According to Kellogg, the vendor has agreed to pay for any shipping if the units break down in the first 30 days and issued a 30-day money-back guarantee as well as a one-year warranty on all parts and labor.

Firestone Tire & Rubber Co. in Akron, Ohio, has standardized on both Zenith Data Systems PCs and various models of IBM's Personal System/2. Selected for their low price, the Zenith units are repaired in-house.

Rick Frye, manager of research and development at Carolina Freight Corp. in Cherryville, N.C., said his company has purchased more than 60 Everex Systems, Inc. System 1800 clones that he claimed are both cost-effective and reliable. If there is a problem, the unit is

fixed on-site by Carolina Freight technicians.

All four users said price was the most important factor in their decision to buy clones. But there are some concessions to be made

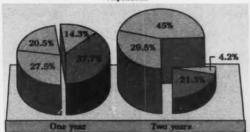
Low-end clone makers (who prefer to be called compatible makers) generally do not offer on-site service contracts. While most offer toll-free service lines, only the most persistent callers ever get through.

Users with problems fre-Continued on page 41

Inside

- C tool helps programmers break 640K-byte wall. Page
- Hyundai file server stands in for stand-alone workstation. Page 42.

Color output Users' purchase plans for the next two years, based on 1,296 respondents



Definitely will buy Probably will buy



Definitely will not buy Probably will not buy

INFORMATION PROVIDED BY CAP INTERNATIONAL, INC.

Bricklin enhances prototype developer

BY ED SCANNELL

NEWTON, Mass. - Dan Bricklin, president of Software Garden, Inc. and creator of Visicalc. last week shipped the follow-up to his Demo Program, which allows both experienced and novice corporate developers to create program prototype

Appropriately called Demo II program, the enhanced product now includes the ability to capture bit-mapped graphics from other programs, a run facility containing more than 100 ac-

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Demo II, which contains the runtime version, costs \$195 and comes with a license to make an unlimited number of copies of the runtime version. Bricklin said the original program, priced at \$74.95, will continue to be available.

The new version also contains a significantly updated user manual along with templates, an on-line tutorial and sample files, and a full-prompted programming language, Bricklin said.

Continued on page 41

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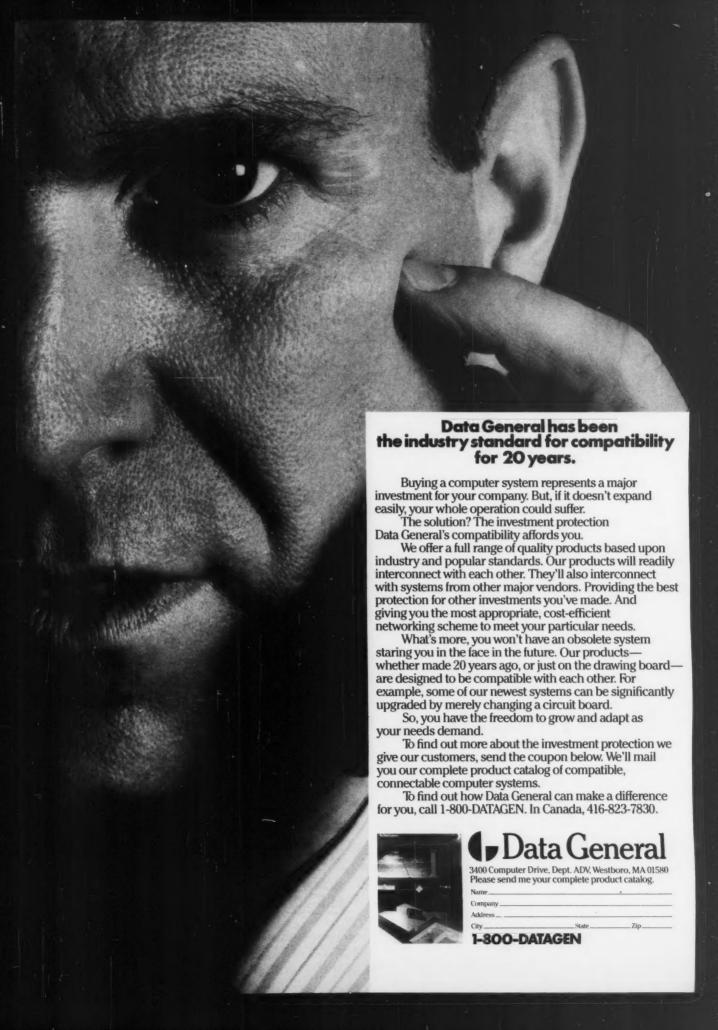
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SMALL TALK

William Zachmann

Modems' little helper



For some reason, personal computer communications software has always been a little intimidating to

me. Although I have a fairly extensive data communications background, I never really feel that I've got things in hand when it comes to modem communications.

Of course, nearly every modem communications package works fine - when it works fine. That's just it: something's always going wrong. For instance, logging on to a new service just doesn't seem to work right. The modem that has always worked fine suddenly can't seem to recognize a carrier tone at 2,400 bit/sec.

That's when the trouble starts. Figuring out what isn't working, why and what to do to fix it is never easy. With different modem settings, data transfer protocols, terminal emulation modes and other variables to choose from, there are lots of ways to go wrong.

As if that weren't bad enough, nearly every modem communications software package ends up making matters even more difficult. All the popular data communications programs seem to have come up with some pretty mysterious ways of doing at least some of the things you need to get done.

Continued on page 40

DOS Merge 286 hits the road

Although price is right, limitations, complexity dissuade some

BY JULIE PITTA

SCOTTS VALLEY, Calif. -The ability to combine Microsoft Corp. MS-DOS and Unix capabilities in one system has users looking to software packages like DOS Merge 286, a joint development product from Microport Systems, Inc. and Locus Computing Corp.

"It has the potential to be the wave of the future," said Paul Cubbage, an industry analyst at Dataquest, Inc. "The average computer user wants multitasking and access to all the system's memory. Combining DOS and Unix allows that."

At \$149, DOS Merge 286, which began shipping in September, should prove inexpensive enough for most users. Although the price is right, DOS Merge 286 may dissuade some because of its limitations. Only one DOS program can run under DOS Merge 286 at a time because of the limitations imposed by the architecture of its Intel Corn. 80286 chip.

Additionally, it may be unsuitable for the average personal computer user because of the complexity inherent in Unix and the difficulty users may experience in switching between the two operating systems.

Like having OS/2 With DOS Merge 286, files are stored on a single file system and may be accessed from either DOS or Unix. Microport said users are able to switch between DOS and Unix by pressing a hot

Microport has billed DOS Merge 286 as a package that gives PC users "the advantages of OS/2 now," referring to the operating system that is currently under development by Microsoft and IBM.

An Intel 80386 version of the software, which was also jointly developed by Locus and Microport, is currently being beta test-

Ronald Bolin, staff manager for Southern Bell Telephone and Telegraph Co.'s network de-partment, said his department has purchased DOS Merge 286 but has opted not to use the package because of its inability to run DOS-based communications software reliably.

Not easy to use
"It's satisfactory with most DOS applications," Bolin said, "but it's unusable in serial communications. It misses characters." He added, however, that data can be transmitted in Unix

Without a good working knowledge of both DOS and Unix, using DOS Merge 286 could prove difficult, users said.

'To go from just using DOS to using Unix represents a pret-ty healthy learning curve," admitted Dave Granz, a consultant for Acrosystems Corp., a Beverly, Mass.-based manufacturer of data acquisition systems.

Acro is using DOS Merge 286

for software development, Granz said. Using the package, users can take advantage of Unix's more powerful software development tools when working on DOS applications.

'Best of both worlds'

"It kind of gives me the best of both worlds." Granz explained. 'But it could be improved. Some programs work better from Unix than others. Some don't allow input and output to be redirected."

Dataquest's Cubbage said he found the product's user interface is unwieldy. "For PC users. it has been kind of complex and difficult to use," he maintained.

"The implementation of the user interface is clumsy and complex. It requires much more knowledge of the computer system than the average user has. The average user doesn't do many operating system com-Cubbage said.

Despite its limitations, DOS Merge 286 may provide users with an inexpensive solution to the DOS-Unix dilemma.

There's a lot of acceptance for this kind of approach," Cubbage maintained. "Hopefully, they'll work out some of the problems on future versions.

PC videotape training lauded as more effective

BY DOUGLAS BARNEY

Microcomputers do not do anything unless someone knows how to use them. But if Learn-PC Video Systems, along with a host of other video-based training firms, has its way, the lack of end-user knowledge will cease to be a problem.

Frances Mendelsohn, information center manager for the Food and Drug Administration, said she believes video is superior to built-in tutorials when it

the many training products used by Mendelsohn are Learn-PC's videos on Microsoft Corp's MS-DOS Ashton-Tate Corp.'s Dbase and Lotus Development Corp.'s 1-2-3.

'Different packages have their own training that comes bundled, but we find you get better training if you take someone else's course," Mendelsohn said. "You can cheat with some of the other systems.

According to Mendelsohn, with built-in tutorials all a user has to do is figure out the sequence or pattern of answers to complete the lesson.

Live presentation needed

With Learn-PC, Mendelsohn runs the video tape, pauses the tape to go over the material covered and allows the class to repeat what it has learned. It takes more than just a tape to get people trained. "I lecture and fill in little gaps. I find these tapes need a live person. People are going to get stuck, and watching the tape 10 times isn't going to get them unstuck," Mendelsohn explained. Mendelsohn also occasionally lends the tapes to users to view at home.

What is the alternative to video-based training for Mendel-sohn? Without it, "it would be much more difficult and much more expensive. You would have two choices: not to train, or hire contractors to do it." she said. This is a cost-effective way to get a lot of people trained.

Learn-PC, based in Minneapolis, offers tapes that cost from \$495 to \$1045.

Despite quirks, Wang laptop suits users' needs

BY ALAN J. RYAN

Wang Laboratories, Inc.'s yearold Laptop Computer certainly has problems users say should be corrected, including a hard-toread LCD screen, a short battery life and a slow built-in printer.

Nonetheless, users interviewed by Computerworld recently said the product's overall performance meets their needs.

"The laptop did everything we expected it to do, but there were a few quirks," said Victor Emanuel, a distributed support analyst at American Family Mutual Insurance Co. in Madison,

Emanuel said the laptop's poor print quality makes it useful for printing rough drafts only and that it offers only 10- and

17.5-pitch printout. "I wanted to get a 12-pitch . . . most applications on the [Wang] VS print out in 12-pitch. But the smaller pitch wasn't available at this time," he added. "But the concept of the printer is good, especially since it still kept the portable under 15 pounds.

A Wang spokesman said the company has always indicated that the printer will not deliver letter quality but that the user has the option of attaching a letter-quality printer to the laptop's RS-232C port.

Users have also cited the laptop's short battery life as a problem. "The battery life is only four hours - and possibly less, if the user is accessing the Winchester or doing printing," said David Hostetler, manager of microcomputer systems at the law

Laptop Computer

Price: \$3,530

• Intel 8086-compatible CMOS

• 8-MHz speed • 16-bit architecture

• MS-DOS 3.2 • 512K-byte memory

expandable to 1M byte Supertwist monochrome LCD with 640- by 200-pixel resolution

• Epson MX-80-compatible printer operating at 18 char/sec. in burst mode

Full-size 92-key keyboard with Wang/IBM legends

firm of Jones, Day, Reavis & Pogue in Cleveland. He added that many laptops have a battery life of 15 to 20 hours

Wang said a new release of Microsoft Corp.'s MS-DOS due in the first part of next year will enhance the utilities that handle disk access, thus taxing the battery power less than it has been.

'During operation, the user will be able to have a quiet drive," the Wang spokesman said. However, he added, "it will still be a four-hour battery life." Users can purchase additional rechargeable battery packs.

While users also complained of a hard-to-read LCD screen. Wang said it currently has no plans to address that problem.

'In the near future, possibly early next year, there will be a cable connection allowing an external color monitor to be attached to the laptop for higher resolution capability," the company spokesman said. But the

LCD screen will remain the only screen available for portable use. he added.

Emanuel also noted that while the Wang laptop has a standard internal half-height Winchester disk drive, the user must attach either an external 31/2- or 51/4-in. disk drive to load software. which he found cumbersome.

The real advantage of the computer, users said, is that it is compatible with Wang's VS.

Hostetler said 15 of the law firm's attorneys are using the portables and that he will likely purchase more. The Wang laptop's word processing advantages make it more appealing to the attorneys, he added.

Right now, we are trying to standardize and look at compatibility issues with our current [Wang] configurations," tetler said. "We want a laptop that is going to meet these needs."

Barney

CONTINUED FROM PAGE 35

Zloof created and developed IBM's Query-by-Example, the same interface that Ansa Software (developer of Paradox) used to attack the procedural language-based Dbase.

Zloof joins the all-star development team of Chan, Wong and Benson, all of whom switched from large-systems software and joined Ashton-Tate to work on micros.

Oh no you don't. Like those of most language vendors, Microsoft's products are restricted by the 640K-byte limit of the firm's MS-DOS, and programmers cannot easily develop big applications. As a result, a shrewd, but perhaps overly ambitious, proposal came from the Microsoft languages group to develop languages that can switch from the 640K-byte-bound real mode to the 16M-byte-bound protected mode of the Intel

Zachmann

CONTINUED FROM PAGE 39

Hayes Microcomputer Products, Inc.'s recently introduced Smartcom III, with a \$249 list price, proves to be an exception to the general obscurity of modem communications software. A completely redone product for IBM and compatible systems with minimal resemblance to Hayes' earlier Smartcom II and with a comprehensible interface, Smartcom III goes a long way toward making it easy for users to understand. A very clean menu structure, liberally supplemented with extensive context-sensitive Help files, is a big part of that effort.

But all this makes for a pretty goodsize program. Smartcom III needs at least a 512K-byte system and takes up nearly 1.5M bytes on a hard disk. However, I don't see that the size makes much difference unless you are running on a system without much disk or memory.

The program also requires a Hayes or highly Hayes-compatible modem. Some modems advertised as "Hayes compatible" really aren't, and they won't work well — if at all — with Smartcom III. Still, I see no reason to blame Hayes for the deficiencies of some modem vendors' compatibility claims. Many modems work fine with Smartcom III.

Nearly every communications program divides up the communications task differently. Smartcom III approaches it in terms of activities, connections, scripts and macros. Connections include things like communications speed and parity.

Activities are defined in terms of what goes on at the personal computer, including things like file-transfer methods used and control of the screen display.

By distinguishing activities from connections, Smartcom III makes it possible to easily set up more than one connection for the same activity. For example, an activity created for calling up one's electronic mail could use different connections, depending on where the call is being made or at what modem speed.

Out of the dozens of programs that I look over, very few find a place on my C disk. Smartcom III is one of those.

Zachmann is vice-president of research at International Data Corp.

80286 microprocessor.

But according to sources, IBM nixed the idea because of concerns that these languages would cut into the demand for the large-memory OS/2 operating system.

No more blank spreadsheets. If Lotus's Information Systems Division has its way, no one will ever have to key in spreadsheet data again — well, almost. According to Don McLagan, division vice-president and general manager, the division's ultimate aim is to provide a series of products that contain reams of data, both numeric and textual, on an array of media such as compact disk/read-only memory (CD-ROM), real-time data feeds and magnetic media. Through im-

proved interfaces and querying tools, a user would be able to intuitively request a particular piece of data, which would arrive quickly, no matter where it might re-

While Lotus isn't promising this level of product anytime in the near future, McLagan says he believes that the firm has most of the pieces in place to get the job done. They've got the real time, the CD-ROM and the retrieval software. A lot of the work is just putting all this stuff together cohesively.

AI SQL? One source speculated that there may be a connection between Lotus's Lotus/DBMS, and Arity Corp., a firm in which Lotus has invested and which provides Prolog products that work with SQL. A Lotus official declined to comment.

SAA it ain't so. An indignant supporter of the old character-mode interface told us recently that although Microsoft is pushing the Presentation Manager as the epitome of the IBM Systems Application Architecture (SAA) user interface, there is a character-mode subset that also conforms to SAA. While the character-mode proponent advocates graphics interfaces for those who desire them, he says you don't need a mouse and IBM's Enhanced Graphics Adapter to get into the SAA swing.

Barney is a *Computerworld* senior editor, microcomputing.



How to get your PCs on speaking

You've got a lot invested in the many elements of your Data Processing operation. Mainframe applications programs. PC software applications. And the necessary micro-mainframe links. But your PCs and

PC users never have to leave their PC application.

mainframe still aren't talking the same language. Your DP staff is burdened with time-consuming and costly chores. Incompatible interfaces must be learned. Extract and import programs must be written for user after user. Improperly formatted data must be manipulated. And micro-mainframe links must be customized.

Your end-users wait for special requests to be processed. Then they perform the time-consuming task of re-keying data, inviting human error. And, even if your PCs are linked, end-users must leave their favorite PC programs to work with micro-mainframe links and mainframe query languages. Another stumbling block in the path of creating a smooth exchange of information.

The Application Connection* (T-A-C) from Lotus* is a maintrame and micro software product that lets you realize your investments in mainframe applications, micro-mainframe links and PC applications by connecting them for a fast, secure, uncomplicated exchange of information.

Clones

CONTINUED FROM PAGE 35

quently resort to mailing the computer back to the vendor, a process that usually takes more than a month. Most compatible vendors offer some type of warranty on parts, averaging from 12 to 18 months.

Do the cost savings outweigh the potential problems? User opinions vary.

"With the lid off, all better clones are the same," Mony's Kellogg said. She added that when she tested several clones against an IBM PC AT, the clones had to run all of the software used by the company's insurance agents in the field and had to include a Phoenix Technologies Ltd. BIOS and a Chips and Technologies, Inc. chip set. A brand name on the box adds little but cost to the computer, she said. Mony selected the Bestron PC, which is manufactured in Taiwan.

Carolina Freight's Frye said he also looks for the Phoenix BIOS and that he will not buy hard drive units unless they have Seagate Technology, Inc. drives. "If I get these components, the name of the vendor doesn't really matter," he said. "I know I've got a reliable box."

Higher 'infant mortality'

The oil company spokesman said his clones are less reliable than the high-end microcomputers, though they make up for that flaw in cost savings. "In long-term reliability, once the machine has

been up and running for months, I don't think it fails any more than an IBM or Compaq," he said. "But we have found that the 'infant mortality' is much higher," with the clones having a failure rate five times higher than that of the high-end machines in the first 30 days, he added.

Brian Camenker, a senior systems analyst with Dynamics Research Corp. in Wilmington, Mass., said the different departments within his company buy many types of personal computers and that not all of them gas radioble.

all of them are reliable.

"It's a trade-off," Camenker said.

"The users go for a low price, but they take a chance on the support being marginal. . . The lower priced ones are the ones most prone to screw up."

PC's Limited provides the oil company

with a one-year warranty with service provided by Honeywell Bull. Users with problems must first call PC's Limited to see if the problem can be resolved over the phone. If not, they call in the Honeywell Bull representative. The computers are sold largely through phone sales.

Users of Delta Computer Corp. machines, which are also manufactured in Asia, can expect a one-year parts and labor warranty, a toll-free line for technical assistance and dealer support. The units, if they fail, are repaired or replaced by a third-party contractor or by Delta itself, according to a spokesman.

Some large end-user companies skirt the often-busy toll-free user service hot lines offered by vendors by providing their own in-house service centers.

Ed Shaffer, a buyer at Firestone, said the company sent its technicians to the Zenith training school to learn how to repair the computers in-house. "We are our own authorized Zenith repair center," he said.

Carolina Freight's Frye said that when his technicians need to repair a clone, they remove the malfunctioning board and replace it. Frye said the ability to repair the units internally, avoiding costly service contracts, weighed heavily on his decision to buy the clones.

For Joseph Giamelli, vice-president of MIS at Toys R Us, Inc. headquarters in Rochelle Park, N.J., service was one reason he decided to stay with his more expensive NCR Corp. equipment than standardizing on clones.

"We get a big discount from NCR because we're big users of NCR's point-ofsale systems," he explained. Giamelli said the company also has purchased some PC's Limited machines. "We had even fooled around with building our own PCs, but it wasn't worth the effort."

Bricklin

CONTINUED FROM PAGE 35

Bricklin, president of the two-person Software Garden, said he spent 18 months designing and implementing Demo II. He said the program includes about 75 features that were not in the original program. "I managed to get about 95% of the changes in that customers were looking for," Bricklin said.

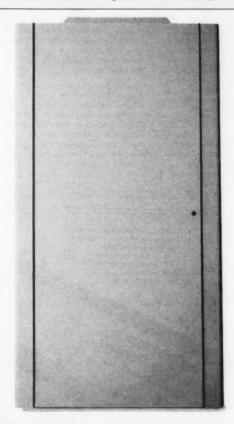
Between 15,000 and 20,000 copies of the original Demo program have been sold direct from Bricklin's Newton home and through selected retailers such as Egghead Discount Software, Inc. and Softsel Computer Products, Inc., an Inglewood, Calif.-based distributor, he said.

Several major software developers have used the product to create products, including Microsoft Corp., which used the program to develop its best-selling integrated program, Microsoft Works.

Bricklin introduced Demo II at a Capital PC User Group meeting in Washington, D.C., last week in a nonpareil fashion. "With a program that can be used to create vaporware, you get very picky about actually shipping before announcing," Bricklin said.

He then brought a Federal Express courier onstage, who carted off the first boxes of the completed product to Softsel for distribution to its dealers. "I can now announce the product," Bricklin said.

Users of the original program can upgrade for \$54.95. Bricklin said he will primarily handle the user upgrades himself.



terms with your mainframe.



T-A-C creates a complete connection, making it the only product available that allows your end-users to securely access a variety of mainframe applications from within their PC applications. For example, from within 1-2-3,* a user can easily extract sales information from a DB2 database.

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So, if you find that the number of end-user requests

you are faced with is growing, but your return on DP investment is not, T-A-C from Lotus can help you get your PCs on speaking terms with your mainframe.

To receive more information about T-A-C, call Lotus at 1-800-345-1043 and ask for product CD-2540.



Lotus T-A-C

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Rational's C tool cracks MS-DOS limit

BY DOUGLAS BARNEY

NATICK, Mass. — C programmers can break through the 640K-byte barrier in Microsoft Corp.'s MS-DOS with the help of Rational Systems, Inc.'s \$795 Instant-C/16M.

Instant-C/16M is an interactive C development tool aimed at helping programmers write large applications, the company said. It is slated to ship next month.

The product, which runs under MS-DOS, takes advantage of the protected mode or large memory capabilities of Intel Corp. 80286 and 80386 chips. With Instant-C, programmers can address up to 16M bytes of memory, according to Rational. Still, programs that are developed are intended mainly for the 640K-byte MS-DOS environment.

Because Instant-C resides in memory above the first megabyte, it leaves room to run a personal computer application like Lotus Development Corp.'s 1-2-3 while the compiler is working, said Terence M. Colligan, president of Rational.

Incremental compiler

Instant-C is a so-called incremental compiler. It speeds compilation by reprocessing only the portions of a program that have been modified.

Instant-C supports Borland International's Turbo C, Lattice, Inc.'s 3.20 compiler and Microsoft's C Version 5.0. The product requires an IBM or compatible 80286- or 80386-based machine running MS-DOS.

Although Instant-C/16M does not allow programmers to develop applications for IBM and Microsoft's OS/2, it does give them OS/2-class memory capabilities, Rational said.

And, according to Colligan, there are currently no incremental C compilers or interpreters for OS/2. The situation should change next spring, when Rational is scheduled to ship an OS/2 version of Instant-C.

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Hyundai 286-based file server debuts

SANTA CLARA, Calif. — Hyundai Electronics America recently introduced an Intel Corp. 80286-based file server that can double as a stand-alone workstation.

Called the Super-286, the Hyundai system offers 12 slots: six each for 16- and 8-bit expan-

sion boards

Additionally, it accommodates five half-height Winchester disk drives in capacities of 20M to 70M bytes of fixed or removable storage.

The Super-286 offers clock speeds of 8 or 10 MHz and 1M byte of random-access memory. the vendor said

The server costs \$1,999 without a monitor.

The new system is the third personal computer product Hyundai has released since launching its U.S. marketing effort in August. Hyundai also offers an IBM Personal Computer AT-compatible machine and an Intel 8088-based microcomputer

A company representative said Hyundai expects to introduce an Intel 80386-based system during the first quarter of next year.

Hyundai has signed 185 independent dealers and 41 valueadded resellers to sell its products.

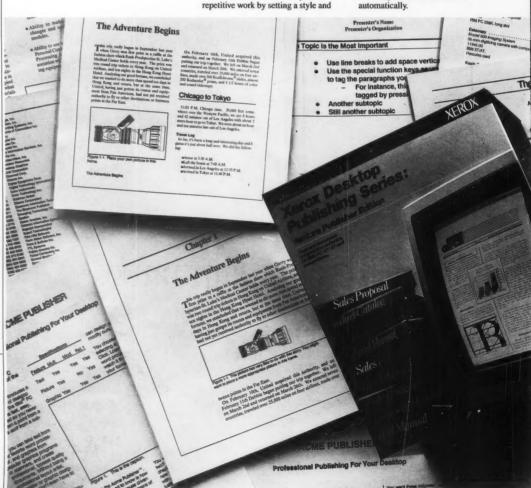
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With Xerox Ventura Publisher, the hard part of desktop publishing, layout and typographic design, is already done. Ventura's unique stylesheets—built-in or custom ones you create yourself—give you graphic skills without requiring you to be a graphic artist. Pour in your text. Slip in your pictures. Click your mouse. And your document formats as quickly as you can say Xerox Desktop Publishing Series: Ventura Publisher Edition.

While other programs make you do a layout a page at a time, Xerox Ventura Publisher controls much of your repetitive work by setting a style and

following it for you—be it one page or a thousand. This powerful tool is just one of the many features that have led major computer publications to designate Ventura the clear leader in MS-DOS desktop publishing.

Consider Ventura's other remarkable features: There's automatic kerning, support for multicolumn frames, cropping and sizing of art, on-screen rulers, and automatic letter spacing. Pictures are anchored to text, and documents up to 128 chapters in length, each containing 150 to 300 pages of text, are easily handled and indexed



E W R 0 DUCTS

Systems

Title of The Seminar

The Darwin-386, a microcomputer configured with a 70Mbyte hard disk, a keyboard and 1M byte of random-access memory, has been introduced by PC Genius, Inc.

Other features of the computer include two serial, two parallel and one game port, a system clock, hardware reset, a turbo LED indicator and a disk-access light. It operates at 12 and 16 MHz at zero-wait states and uses Award Software, Inc.'s 386 BIOS

The Darwin-386 comes standard with a monochrome monitor. It is priced at \$2,995.

PC Genius, 100 A Tower Office Park, Woburn, Mass. 617-933-8442

Software applications packages

Data entry software said to emu-

TITL E

late operational features of the IBM 3742 and 3741 keypunches has been introduced by Nuenor Microsystem

The product, DEPC, features edit rulers, automatic reproduction templates and batch verify functions. Once data is input, it is stored on a diskette and may be uploaded to a host using third-party file transfer soft-

Other features include a software-customized keyboard, automatic numeric checks, automatic duplication options, a keys-pressed-per-minute indicator and a record counter.

DEPC costs \$49. An unlimited-copy site license costs \$190.

Numenor Microsystems, 69 Summerhill Ave., Toronto, Ont., Canada M4T 1A9. 416-925-

An integrated desktop presentation system for use with Apple Computer, Inc. Macintosh II personal computers has been announced by Cricket Software.

Cricket Presents features text-handling capabilities such as justification, tabbing, indentation, margins, advanced tabling and a set of drawing tools. Users can customize font size, style and color and can incorporate shapes in the creation of graphs, charts and tables.

Scanned images and graphics can be imported from any standard PICT format or graphics including Cricket program. Draw, Cricket Graph, Pict-O-Graph and Apple's Macpaint and Macdraw.

Cricket Presents costs \$495. Cricket Software, Great Valley Corporate Center, 30 Valley Stream Pkwy., Malvern, Pa. 19355. 215-251-9890.

Languages

An Intel Corp. 80386 compiler called NDP Fortran-386 has been announced by Microway, Inc.

According to the vendor. code generated by NDP Fortran-386 and executed using Microway's 80386 numeric co processor, MW1167, runs 16 times faster than on an IBM Personal Computer AT with an Intel 80287 processor.

The speed of execution, the vendor said, is a result of the use of 32-bit mainframe compiler technology that includes global optimization and register utilization. NDP Fortran-386 generates native 80386 code that runs in protected mode under Microsoft Corp.'s MS-DOS or Unix V. The addressable memory available in the linear address mode is 4G bytes.

The NDP Fortran-386 compiler costs \$595.

Microway, P.O. Box 79, Kingston, Mass. 02364. 617-746-7341.

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DECEMBER 14, 1987

COMPUTERWORLD

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Toys "R" Us, the world's largest, fastest growing toy specialty retailer, wanted to install a scanning-based sales capture and credit authorization system at 313 lc cations in only six months.

"We do 50% of our volume in October through December," states Charles Lazarus, Toys "R" Us CEO, "so we wanted the system working in our major markets well before Christmas to get our people comfortable with it. Digital got it on-line by late August, and tailored their service solution to meet our needs."



"In just 6 months, Digital gave all 313 Toys 'R' Us stores a sales and credit system for Christmas."

Mr. Lazarus sees Digital's involvement as an integral part of the phenomenal Toys "R". Us success story. "Even though we're four times the size of our nearest competitor, and we stock over 18,000 different items, we move and make decisions faster. That's why we've grown more than 30% annually for the past nine years. Digital, their networking, and the information edge they give us, have played a vital role in that growth. They're our kind of company...a winner."

To get your competitive advantage now, write: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742. Or call your local Digital sales office.



Software utilities

Central Coast Software has announced Precisely, a "what-you-see-iswhat-you-get" word processor, and Quarterback, a hard- to floppy-disk backup utility. Both were designed for the Commodore Business Machines, Inc. Amiga series of personal computers.

Precisely supports multitasking, multile windows, keyboard macros, on-line

Help and column cut and paste.

Quarterback is said to be capable of transferring 20M bytes to floppy disk in 45 minutes. It supports full, subdirectory or incremental backup and restore with automatic formatting of diskettes, cataloging of files and diskette sequence num-

bering and checking.
Precisely costs \$79.95. Quarterback costs \$69.95. Shipping costs an additional

Central Coast Software, 268 Bowie Drive, Los Osos, Calif. 93402. 805-528-

Development tools

Intermec Corp. has introduced a personal computer-based program development system using its Interactive Reader Language (IRL).

IRL is a programming language deigned specifically for data collection. It features data editing and record look-up commands for portable bar code reading and on-the-spot verification. The pro-

gram development system, called PC-IRL, includes a page editor, a compiler and a debugger with a reader display sim-

According to the vendor, IRL programs can be stored on disk or transferred between the PC and any IRL read-

PC-IRL costs \$495.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynnwood, Wash. 98046. 206-348-2600

Software enhancements

Version 5.00 of the Applications Communication Control System (Access) software library has been released by Trilobyte Software System

Designed for use in the IBM PC-DOS environment, Access is said to integrate program development, system security, data communications and application support. Features include a screen map generator for painting and calling custom screens with data fields, support for 50 function keys, support for remote access, file transfer with error checking and asynchronous control routines

Access Version 5.00 costs \$245. Trilobyte, 295 Los Angeles Blvd., San Anselmo, Calif. 94960. 415-457-3431.

Data storage

A 51/4-in. enhanced small device interface Winchester subsystem for IBM Personal Computer ATs and compatibles has been announced by PMC Associates.
The subsystem, called the ESDX-PC,

comes with one or two removable drives featuring average access times of 16.5 msec and data transfer rates of 1.86M byte/sec. The single-slot controller supports up to four drives.

Other features include switch-selected direct-memory access, port addressing interrupts and 32-bit error detection control with 11-bit error correction control. It is compatible with Microsoft Corp.'s MS-DOS and Xenix, IBM's PC-DOS and AIX and local-area networks from IBM. 3Com Corp., Novell, Inc., Orchid Technology, Inc. and Ungermann-Bass, Inc.

PMC Associates, 74 North Central Ave., Ramsey, N.J. 07446. 201-934-1835.

Printers/Plotters/ Peripherals

The Macfactory-ST3 product line, designed to link data collection devices, bar code readers, robots and programmable logic controllers to Apple Computer, Inc. Macintosh personal computers, has been announced by Synaptic Technologies,

According to the vendor, the products assist in the creation of localized reports, store data and forward the information to the manufacturing resource planning sys-

The Macfactory-ST3 has four ports, one of which is dedicated to the Apple Appletalk network. The other three can run different protocols simultaneously, the vendor said. They can address 32 devices per line.

The Macfactory-ST3 hardware and software cost \$1.995.

Synaptic Technologies, Suite C106, 16 Hughes, Irvine, Calif. 92718. 714-859-0570.

Auxiliary equipment

Control Cable, Inc. has added two uninterruptible power supply products to its ine of power protection devices for the IBM Personal Computer XT and PC AT.

The 330XT Plus and the 450AT Plus are manufactured by American Power Conversion Corp. The 330XT Plus is said to feature a nominal service time of-10 min for an XT. The 450AT Plus provides 20 min for an XT and 10 min for an

The 330XT Plus costs \$399. The 450AT Plus costs \$499.

Control Cable, 7261 Ambassador Road, Baltimore, Md. 21207. 301-298-

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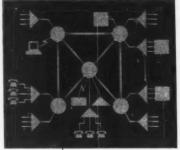
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White papers, red faces



there's been a major run on white paper down on LAN Lane. No. it's not because of a

white sale sponsored by the local stationery shops, but rather a version of the axiom, "Those who can't, teach." In this case, it might be better rephrased to read, "Those who haven't delivered generate a lot of hot air."

The mails are being flooded with white papers on OS/2 networking from LAN Manager proponents and co-developers 3Com and Microsoft, Rival unbeliever Novell was slated to deliver a white paper outlining its product strategy last Friday. And the last of the triumvirate of dominant local-area network operating system vendors, Banyan Systems, was also readying its own white paper, reportedly addressing IBM's Systems Application Architecture, of which OS/2 is the first piece.

To be fair, white papers at times a manifestation of all talk and no action - can be beneficial, indeed eagerly received, if used to clear up confusion or provide technical information. On the other hand, if used to market grandiose claims or slyly create confusion beneficial to the author, then writers accomplish little more than muddying their names. And users should let them know about

The papers may be white, Continued on page 59

Loosening SNA technical knots

IBM addresses peer-to-peer LU6.2 complaints, opens SAA umbrella

BY ELISABETH HORWITT

RALEIGH, N.C. - MIS managers who have been stymied by the technical intricacies of peerto-peer Systems Network Architecture (SNA) can expect to see IBM products that directly address the problem next year, IBM told Computerworld recently.

Since 1983, when the first LU6.2 protocols shipped, IBM has received feedback indicating users want more portability, particularly in the multiprocessor environments of IBM System/36s and 370 computers. Users also want applications to communicate across different system environments, according to Donald Haile, director of busi ness and systems management for IBM's Communication Products Division.

IBM has been steadily expanding LU6.2 support across its various systems in the past

year or two. For example, last June, the vendor announced LU6.2 for VTAM, VM/SP systems and front-end processors

However, peer-to-peer SNA has two major flaws, according to a recent report by Forrester Research, Inc. in Cambridge, Mass. First, crucial new ele ments will not ship until late 1988 or 1989. Second, the communications protocols are so complex that many application developers and MIS managers are reluctant to work with them.

'Confusing kaleidoscope'

"The demands of migration mean that IBM offers a confusing kaleidoscope of variables for networking," the report stated. including operating systems that 'all feature different capabilities," an as-yet-unannounced Network Control Program and several varieties of VTAM. "Users must build a strategy from this jumble of options," the re-port continued. "The complexity of new SNA will be particularly daunting for neophyte departmental end users — a pri-mary target for the IBM 9370."

According to IBM spokesmen from the Raleigh research and development facility, IBM will make some major communications announcements next vear that will address the problem of LU6.2 complexity.

One key development, which started this fall, is the development of standard programming interfaces that will allow applications to migrate and communicate across different IBM systems within the Systems Application Architecture (SAA) umbrella. Haile indicated.

As part of the SAA direction. IBM introduced the Common Programming Interface (CPI) earlier this year, which is the idea of having a simple, uniform set of commands that each SAA service or system incorporates in its application interface. This

Continued on page 58

Early peek at 3+Open on 0S/2

BY PATRICIA KEEFE

SANTA CLARA, Calif. - 3Com Corp. last week staged the first demonstration of its 3+Open network operating system running over IBM's OS/2 in both a workstation and a server.

However, the software exhibited by 3Com was actually a preliminary 3+Open release that was designed to run on an early version of IBM's OS/2 Standard Edition 1.0, as opposed to the version of OS/2 that was delivered last week to various retail shelves.

3+Open, which is based on Microsoft Corp.'s OS/2 LAN Manager, is slated for delivery in June 1988, along with the LAN Manager.

3+ additions

At the 3+Open demonstration, 3Com also announced first-quarter delivery of an enhanced version of 3+, its current Microsoft MS-DOS-based network soft-

The enhanced 3+ will provide OS/2 workstation support. Pricing and technical details for this interim product will be pro-Continued on page 59

Inside

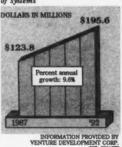
 Vendors and user organizations to test latest MAP and TOP versions. Page 57.

 Apollo provides commer cial support for MAP for the first time. Page 60.

· Harris offers an IBM-comnatible local-control unit. Page 65.

Continuous process industries slow LAN installation

Probable cause: Manufacturers have put off plantwide integration



sitting on LAN laurels

Yesterday's net mavericks

BY ELISABETH HORWITT

Continuous processing manufacturers, which led the charge in industrial networking installations in the early 1980s, have held back from the next step of interconnecting different production processes and vendors' equipment, according to a recent report from Venture Development Corp.

Chemical/petrochemical manufacturers, oil refining companies and utilities began install-

ing distributed control networks as far back as 1975, according to Venture. Contrary to vendors' and industry experts' expectations, however, many of these companies have not gone on to link their islands of automation into a single, plantwide network, the Natick, Mass., research firm

The industrial local-area network market for continuous process industries will grow 9.6% annually for the next five years, the report said (see chart).

Continued on page 55

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Vendors test TCP/IP-Netbios bridge

Event predicated on a standard interface agreed on at March forum

BY PATRICIA KEEFE

ARLINGTON, Va. — A successful test of a Transmission Control Protocol/Internet Protocol (TCP/IP)-to-Netbios interface, offset by a failure to agree on a standard for TCP/IP network management, was the main event at the second annual TCP/IP Interoperability Conference here.

The show's sponsor, Advanced Computing Environments, said the technically oriented four-day event, which featured day-long tutorials and breakout sessions, attracted about 900 attendees.

Five vendors participated in a demonstration designed to show off the ability of IBM Netbios-based network operating systems and applications to run across TCP/IP-based local-area networks.

Vendors testing their Netbios implementations included Bridge Communications, Inc.; Excelan, Inc.; Ungermann-Bass, Inc.; and Syntax Systems, Inc. Network General Corp.'s protocol analyzer was used to test the various implementations for interoperability.

Pressure pushed standard

The interoperability test was predicated on a standard for a Netbios interface to TCP/IP that was agreed on at an interoperability forum that was held last March.

Without such a standard, multivendor TCP/IP microcomputer networks would not be possible. And without the pressure that was exerted by large users, the standard would have taken much longer to crystallize, according to Bart Burstein, group product manager for Net/1 TCP at Ungermann-Bass.

"The whole thing was driven by large users. We were bludgeoned into it," Burstein said. "Quite honestly, they told us, 'If you don't fit together with the other guys, we won't buy your product.' The message was heard by vendor management, and now we are all actually working together."

In an example of the cooperative spirit, ambiguities within the specification were worked out collectively by the participating vendors prior to last week's test.

"I was quite frankly flabbergasted [that the test] worked as well as it has," Burstein commented.

Single networks

Despite the reason behind the Nethios interface, most of the conference attendees talked about doing personal computer networking over single TCP/IP nets, equivalent to a single building, Burstein said. His customers tend to want to install one network across multiple sites, he

Ungermann-Bass will address the concern of an enhanced version to allow users to support multiple vendor networks with a first-quarter product release, Burstein said.

The Network Management and Gateway Monitoring Work Groups, which had hoped to set-

tle on preliminary specifications for TCP/IP network management and multivendor routing protocols at the conference, were forced to delay a decision for three months.

The postponement is said to have resulted from a division among members of the committees.

One group, primarily vendors, rallied behind the International Standards Organization's Open Systems Interconnect (OSD) protocols, while a second group, mostly users, backed another method for managing large networks.

The group plans to choose by February between OSI's CMIS and CMIP protocols and a network management system being developed by BBN Laboratories, Inc.

WE BELIEVE THAT THE GENIUS OF THE FUTURE LIES NOT IN TECHNOLOGY

Giant MAP/TOP demo slated for '88

BALTIMORE — More than 40 vendors and nine user organizations will set up a demonstration network next year to test the latest versions of Manufacturing Automation Protocol (MAP) and Technical and Office Protocol (TOP). The link is scheduled to take place at the Enterprise Networking Event '88 International, which will be held here June 6-9.

The local-area network is being designed to test interoperability among different vendors' devices, using the long-awaited MAP and TOP 3.0 releases, according to the Society of Manu-

facturing Engineers

The network will link nine worldwide sites belonging to a variety of industrial organizations, including Deere & Co., Boeing Computer Services, TRW, Inc. and General Motors Corp. Other organizations slated to participate in the event in-

clude the British Department of Trade and Industry and European-Wide Computer Networks for Manufacturing Applications, which is managed by British Aerospace PLC. The LAN will also link all the booths on the convention floor.

Among the vendors participating in the demonstration will be AT&T; Bull International; 3Com Corp. subsidiary Bridge

Communications, Inc.; Concord Communications, Inc.; Control Data Corp.; Digital Equipment Corp.; Eastman Kodak Co.; Hewlett-Packard Co.; Micom Systems, Inc. subsidiary Interlan; Retix Co.; Touch Communications, Inc.; and Unisys Corp.

The event will be cosponsored by the MAP/TOP Users Group and the Corporation for

Open Systems.

Tools to test whether various endors' equipment conforms to MAP and TOP protocols are being developed by the Communications Network for Manufacturing Applications Esprit project, sponsored by the Commission of the European Communities. Participants in the project will include Nixdorf Computer Corp., Ing. C. Olivetti & Co., BMW AG, Peugeot SA and Bull. After the event, the test tools will be marketed by Standard Promotion and Application Group Services.



FROM PAGE 51

In contrast, revenues from discrete and batch-manufacturing LAN installations should grow at a 20% annual rate, Venture predicted.

Perhaps the biggest reason for the current slowdown in continuous process networking, according to Venture, is the conservative attitude of designers and systems planners.

Network implementors surveyed by Venture said they needed proven and reliable networks to support critical plant processes, particularly real-time control applications.

Tried and true

With reliability as a major concern, continuous process industries have stayed away from unproven and unfamiliar networking technologies, preferring to stick with known products and vendors. This explains in part why continuous process companies have been behind discrete and batch manufacturers in the adoption of the Manufacturing Automation Protocol (MAP) networking standard, the report said.

Many continuous processing firms are waiting for the technology to prove itself, Venture said. One reason they feel that they can afford to do this is that, unlike many discrete and batch manufacturers, which use a wide variety of vendors, continuous process manufacturers tend to rely on one vendor for all process control requirements in particular plant areas.

The success of MAP will depend on its adoption by all manufacturing industries, Venture said. Currently, however, only a few of the largest continuous process firms have committed to implementing the standard.



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SNA

CONTINUED FROM PAGE 51

allows applications to be written to the same set of verbs, screening the programmer from the intricacies of the underlying system — such as VTAM or LU6.2. Such applications will be portable across all of the systems within SAA without the need to rewrite them for each system, Haile claimed.

In October, IBM introduced a Common Programming Interface for Communications (CPI/C), which provides a uniform set of verbs for applications to call LU6.2 functions.

The initial introduction, designed for Versions 6 and 7 of the VM/SP operating

system, is scheduled for shipment in October 1988, along with IBM's implementation of LU6.2 under VTAM in the VM environment.

This should make it a lot more feasible to implement VM applications on "true blue LU6.2, because we had to concede that VM is not really an SNA environment — although we're working on it," Haile said. IBM plans future introductions of CPI/C for other SAA systems, "so that eventually you won't have to say 'Execute CICS' but just write simple CPI/C verbs" to access LU6.2 peer-to-peer networking functions across different systems, Haile said.

An IBM programming priority is to provide an SAA interface that allows an application to use LU6.2 verbs to obtain

direct access to a data base on another system, according to Vijay Ahuja, IBM senior programmer for SAA.

The CPI for communications only links applications. IBM's Distributed Data Manager (DDM) provides the direct link to data bases but is not part of SAA and is not supported by the common programming interface. As a result, "it takes a lot of software work" to port applications written for DDM across different IBM systems, Ahuja said.

IBM is also working on a common directory that will establish routing paths for applications to communicate across a multiprocessor environment, Haile said. "Right now, SNA programmers have a lot of responsibility for defining routes," he said.

Apollo backs MAP standard with interface

BY ELISABETH HORWITT

CHELMSFORD, Mass. — Apollo Computer, Inc. has taken the Manufacturing Automation Protocol (MAP) plunge, entering into an agreement with Concord Communications, Inc. in Marlboro, Mass., to provide interfaces between Apollo workstations and MAP 2.1 networks.

This is the first time Apollo has provided commercial support for the factory networking standard, according to Robert Chiras, the vendor's group marketing manager for communications and networking. An increasing number of customers have asked Apollo's sales force for ways to link its workstations with devices on the factory floor, such as programmable logic controllers, Chiras said.

Apollo said it feels this is the right time to support MAP, because the technology has matured "beyond the stage where most users are pioneers who catch all the arrows from the Indians." Early users who have stuck with MAP are now demanding that workstation vendors such as Apollo provide MAP compatibility, Chiras added.

"The people I talk to more and more say they want to distribute information" between factory floor devices and other areas of manufacturing, such as design, Concord spokeswoman Suzanne Barclay said.

"MAP is spreading beyond the factory floor to materials planning, CAD and inventory control, and workstations are a big part of that market," Barclay added.

For example, Deere & Co. has linked its computer-aided design (CAD) work-stations to computerized numerical controllers, "so that if a part goes wrong, the user can actually pass the corrections back to the CAD station," Barclay explained.

Partners since summer

Apollo and Concord have worked together since this past summer to modify Concord's Mapware Series 1200 Communications Controller and software to work with Apollo workstations, Chiras said.

The two companies performed joint testing to ensure that the controller and the workstation will work together, he added. Under the agreement, Apollo will refer all requests for MAP interfaces to Concord.

The workstation vendor chose Concord because its interfaces feature frequency agility and network management and can support up to eight simultaneous sessions, Chiras said, "and because we think they are in [the MAP arena] for the long haul." The interface will be upgraded to MAP Version 3.0 when the newest MAP release is available, Chiras said. "Until then, we have the basis" for MAP networking, he said.

The Mapware Series 1200 is an IBM Personal Computer AT-compatible device said to support all seven layers of the MAP model. Available immediately, the controller is priced at \$2,695.

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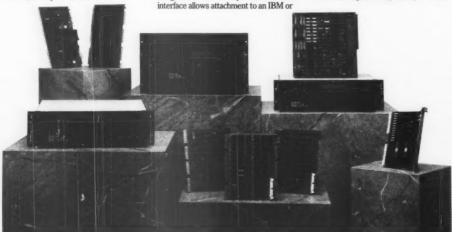
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Keefe

CONTINUED FROM PAGE 51

but in this instance they were triggered by Big Blue's unveiling of its OS/2 LAN Server at Comdex/Fall '87 last month.

Adding to the general state of confusion enveloping the PC LAN arena these days, IBM preannounced a product slated for delivery in November 1988 that requires OS/2 Extended Edition (scheduled to ship in July), adding it would use portions of LAN Manager, which is also scheduled to ship in mid-year or there-

However, IBM said it would not endorse LAN Manager and will not support LAN Manager applications programming interfaces. IBM encouraged software developers to write to the Advanced Program-to-Program Communications (APPC) interface.

Invisible support 3Com was the first to respond with a white paper promising support for APPC and guaranteeing compatibility with LAN Manager, OS/2 LAN Server and, last but not least, any applications written to OS/2. Pretty interesting, given that with the exception of OS/2 Standard Edition, none of the above mentioned products is supposed to ship for another eight months.

In addition, 3Com has a June delivery date for 3+Open, a new version of its 3+ network operating system. To its credit, 3Com demonstrated support for OS/2 on the workstation and server sides last week for the first time. That's a step in

the right direction.

Rumor has it that Microsoft was less than thrilled by the cocky tone of 3Com's paper: So much so that two weeks ago, Microsoft released its own white paper, which essentially echoes technical information in 3Com's dissertation, albeit with a much more low-key approach.

The name game

There are two interesting twists to the Microsoft paper. First of all, Microsoft has renamed two portions of the LAN Manager, now called LAN Server (server software) and requestor (redirector). By coincidence, IBM uses the same names Deliberately or not, Microsoft appears to be trying to confuse users, who already have enough trouble sorting out the dif-

3+ Upen CONTINUED FROM PAGE 51

vided within 60 days, 3Com said.

Customers who purchase this version or an upgrade package for their current 3+ will receive full credit when they migrate to 3+Open, the company said.

3Com said the product was designed to give users assurance that their investment in 3+ guarantees OS/2 server and

workstation compatibility in the future.

The demonstration featured 3Com's Etherlink Plus adapters and an Intel Corp. 80386-based workstation adapted for use as a 3+Open OS/2 server.

configuration also 3Com's Tokenlink Plus adapter. Features include windowing, pull-down menus, remote server access via interprocess communications, a concurrent-mode server operation, session management features and audit trail capabilities.

ferences between the Microsoft and IBM offerings

And then there's Novell. Ever the busy bee, Novell is bursting at the seams with preannounced - but unshipped products. Let's see, there's Systems Fault Tolerance Level III (file server mirroring); Netware for Apple's Macintosh, announced more than a year ago; Netware for VMS: and Advanced Netware 2.1.

The latter Novell ware was first unveiled in February, announced again in August, slated to ship in September and, last we heard, scheduled to ship last Friday. Netware 2.1 was delayed in order to add OS/2 support, Btrieve and Novell's Message Handling Service, a spokeswoman said.

Meanwhile, Novell, too, has been making promises, namely that it will support OS/2 at the server without licens ing LAN Manager. (3Com vehemently insists Novell can't pull this off.) Again, it's hard to cut through the gale force here without even knowing how Novell plans to accomplish this, never mind without experiencing the look and feel of a real product

In the dark

Banyan also has yet to detail its position on OS/2 networking beyond supporting OS/2 at the workstation. Banyan tends to wait for other players to go public with their plans before commenting them-selves, a spokeswoman said. "The problem is that no one really knows what

IBM is doing," she added. Nor does anyone know what Banyan is doing, at least as far as OS/2 is concerned.

The point here is that although the vendors may see white papers as a valid form of air freshener, all users end up with is yet another layer of obfuscation. Without actual products to compare all these explainers, claims and guarantees with, it's debatable how much comfort white papers really offer corporate planners and strategists.

So, passing on a tip from Col. North, let's shred those papers, zip those lips and start shipping some iron, or I should say in this case, software.

Keefe is a Combuterworld senior editor, network-

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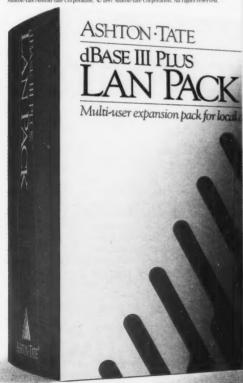
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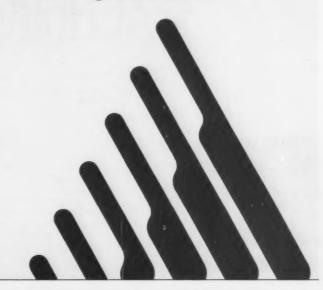
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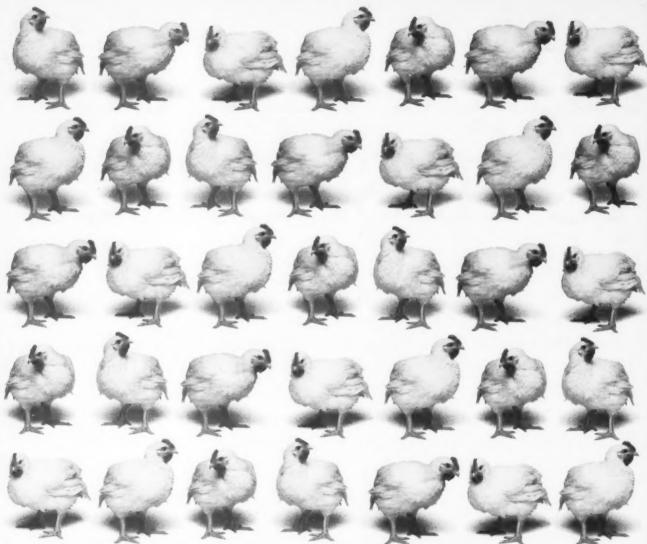


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substantial improvement ratios," Clontz said. "In the time a programmer might turn out one CICS command-level program, he can turn out from six to eight programs on MANTIS."

Most of the 500-plus MANTIS applications now in production at Holly Farms are aimed at streamlining costs. For example, Data Processing used MANTIS to develop a model of how chickens consume feed over the course of their lives, allowing Holly Farms to cut production at one of its feed mills by 11/2 days a week.

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NEW RODUCTS

Local-area network hardware

An IBM 3174-1L-compatible local-control unit has been introduced by Harris Corp.'s Data Communications Division.

The controller, called the H174-32L local-control unit, features token-ring network support and a distributed multimicroprocessor design for support of up to 56 devices. Support for up to 3.5M bytes of memory and a second diskette drive are also included.

Other features include support for multiple concurrent sessions, network management facilities and an integrated English-language user interface.

The H174-32L local-control unit is priced from \$12,500.

Harris, 16001 Dallas Pkwy., Dallas, Texas 75246. 214-386-2000.

Local-area network software

Version 2 of Lanbatch, a batch proces sor system for Novell, Inc. Advanced Netware, has been announced by Keylogic, Inc.

Lanbatch allows network users to submit batch jobs to a separate workstation, freeing their terminals for other work. The batch transmitter provides control over such features as queue priority, path control and job scheduling.

Version 2 includes daily repeat jobs, additional queue control functions and job-log files. Multiple batch servers working from a common queue are offered as an option. A utility that allows sections of a job to be executed on different batch processor workstations is also included.

The software costs \$125 for a single batch server and \$325 for multiple batch

Keylogic, P.O. Box 13063, Research Triangle Park, N.C. 27709. 919-544-6071

Customer-premise equipment

Racal-Milgo has added Switchlink-56 to its digital access product line.

Switchlink-56 is said to provide dial-up 56K bit/sec. digital transmission using AT&T's Accunet switched 56K bit/sec. service. It operates as a dial-up data and customer service unit for synchronous, full-duplex data communications over four wires.

The device can be used to back up a critical point-to-point data phone digitalservice circuit until that circuit is restored or to transmit overload during peak traffic hours. Other applications include host-tohost file transfers and personal computerto-PC communications.

Switchlink-56 costs \$3,200.

Racal-Milgo, 1601 N. Harrison Pkwy., Sunrise, Fla. 33323, 305-475-1601.

Gulfstream Microsystems, Inc., a division of DEST, has announced a singleslot personal computer-to-facsimile addin card that reportedly allows applications to print output to a distant facsimile machine by emulating a printer.

EZ-Fax is said to support multitasking. According to the vendor, it automatically manages conversion of data for transmission or printing, sending and re-

ceiving messages, spooling foreground and background tasks and scanning. It routes each incoming message both to the printer and to a holding file and performs unattended dialing and redialing.

The card supports such graphic printers as Epson America, Inc.'s FX series: IBM's Graphic Printer: and the Hewlett-Packard Co. Laseriet series.

The EZ-Fax card works in IBM Personal Computers and compatibles. It costs \$1.495.

Gulfstream, 1065 S. Rogers Circle, Boca Raton, Fla. 33487, 305-994-6500.

S&H Computer Systems, Inc. has introduced software for micro-to-minicomputer communications

The software, called Messagenet PC and Messagenet VAX, is said to allow personal computer users to transfer messages and files to Digital Equipment Corp. VAX minicomputers and other PCs running Messagenet. It also automates the use of Western Union Telegraph Co.'s Easylink Instant Mail Manager and MCI Communications Corp.'s MCI Mail electronic mail services, the vendor said.

Capabilities include editing, transmis sion scheduling, mailing lists, archiving and system use monitoring. Other features include a word processor, acceptance notification, a file folder storing system, an address book and a calendar function.

Messagenet PC costs \$185. Message net VAX costs from \$1,125 to \$3,000.

S&H Computer Systems, 1027 17th Ave. S., Nashville, Tenn. 37212. 615-327-3670

SimPC Master, a communications and file transfer package said to support application integration over coaxial, local-area network, IBM Systems Network Architecture, asynchronous and CCITT X.25 connections, has been announced by Simware. Inc.

The product includes IBM host and Personal Computer components that provide MVS/VTAM, GCS/VTAM and sites with the ability to link PC users with corporate data communications networks and departmental processors. Support is provided for full-screen file transfer of IBM's CICS, TSO and CMS application data. Users can also upload and download most IBM PC-DOS files.

Also featured are background file transfer, customizable functions and support for Xmodem and Kermit.

SimPC Master costs \$325.

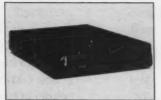
Simware, 20 Colonnade Road, Ottawa, Ontario, Canada K2E 7M6. 613-727-

Modems/Multiplexers

A full-duplex 9.6K bit/sec. CCITT V.32 modem has been introduced by Anderson Jacobson, Inc.

The AJ 9631-SA operates synchronously or asynchronously on dial-up networks. It features trellis-coded modulation, local and remote echo cancellation and satellite transmission capabilities. In leased-line operation, the AJ 9631-SA features unattended automatic dial backup on the switched network.

Other features include autodialing, front panel controls and such diagnostics



The AJ 9631-SA modem

as standard loop-back tests and an end-to-

The AJ 9631-SA costs \$3,095. Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131, 408-435-8520.

A modem that includes a CCITT X.25 packet assembler/disassembler (PAD) has been announced by Telenetics Corp

The Model 24S-MP is a 2,400 bit/ sec. half- or full-duplex, synchronous or asynchronous modem with an X.25 PAD option. The option allows the modem to communicate directly with X.25 packet-

The modem meets CCITT V.22 and Bell 212 and 103 standards. It uses the standard Hayes Microcomputer Products. Inc. AT command set and offers autodial and autoanswer. The PAD option provides a six-digit stored ID. Statistics include time and date of call, call and telephone connection duration, packets and segments.

The Model 24S-MP costs \$595. The X.25 PAD option costs \$150.

Telenetics, 895 E. Yorba Linda Blvd., Placentia, Calif. 92670. 714-524-5770.

Concord Data Systems, Inc. has added the 296 Trellis modem to its line of 9.6K bit/sec. CCITT V.32-compatible modems

The 296 Trellis is a full-duplex asynchronous and synchronous modem built to the V.32 standard. Its features include

full-duplex two-wire dial-up and leasedcommunications, Microcom Networking Protocol Class 4 error correction and remote modem configuration. capabilities. The product also provides automatic dialing and answering capabili-

The 296 Trellis costs \$1,795. Concord Data Systems, 397 Williams St., Marlboro, Mass. 01752. 617-460-

Astrocom Corp. has announced that its Series 8000 subrate digital multiplexer meets compatibility standards for use with AT&T's Subrate Digital Multiplexing Service.

According to the vendor, the test for compatibility was conducted at an AT&T test facility in Holmdel, N.J.

The product is available in configurations supporting five, 10, 15 and 20 ports. Pricing starts at \$3,350.

Astrocom, 120 West Plato Blvd., St. Paul, Minn. 55107, 612-227-8651.

A T1 multiplexer for data communications has been announced by Coastcom.

The multiplexer, called T1 M, is said to take synchronous and asychronous data from local-area networks, computer-aided design and manufacturing, facsimile, personal computers or host computers and convert it into a T1 signal to be used for connection to a public or private T1 network.

According to the vendor, synchronous data is protocol-transparent and is compatible with Digital Equipment Corp.'s DMR11 synchronous interface.

Four independent data ports and an optional voice-maintenance port are provide ed; in addition, any data rate up to 1.54M bit/sec. can be selected for each data port, the vendor said

T1M is priced from \$3,895.
Coastcom, P.O. Box 27068, 2312
Stanwell Drive, Concord, Calif. 94527. 415-825-7500.

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SYSTEMS & PERIPHERALS

HARD TALK

James Connolly

Get the max from a mini



Amid all the talk about downsizing and how personal computers today pack the raw CPU punch of

yesteryear's mainframes, it may be easy to forget an entire class of systems that benefit from the same circuit integration as PCs.

The first Motorola 68030based minicomputers have been scheduled for delivery by companies including Motorola, General Automation, Alpha Microsystems and Harris. Built around a chip that went into production three months ago. the systems are making their debuts about a year after PCs and minicomputers based on the 80386 chip made by Motorola's rival. Intel. A string of 68030-based systems are likely to be announced during 1988 as workstation and minicomputer vendors upgrade their Motorola 68020-based products.

A pattern has set in, with vendors leapfrogging their own products as denser, faster chips are announced and chip makers leapfrog each other. Intel, Motorola and National Semiconductor have each staked claims to the fastest chips at various times, and those players have

Continued on page 68

CDC plots to lure fresh users

BY JEAN S. BOZMAN

MINNEAPOLIS - Control Data Corp. is looking for a new type of customer - one who does not already own a CDC mainframe or Cyber 205 com-

To branch out, CDC is trying to improve the way its sales force learns about new products - and to portray its product line as a continuous series running under the company's NOS/VE operating system.

Gil Williams, vice-president of CDC's Computer Systems group and one of the executives charged with the job of restoring order after several years of fiognizes that not everyone is ready for CDC's 64-bit architecture, particularly not those in IBM mainframe shops.

Industry analysts say that CDC's base is stable but susceptible to erosion from Digital Equipment Corp. and IBM.

Williams said he believes that even in mixed accounts, inroads can be made through the introduction of engineering workstations and mid-range Cyber 930 departmental processors. One added attraction is the availability, through the CDC sales force. of high-end supercomputers from ETA Systems, Inc., a CDC subsidiary.

According to Williams, new



Gil Williams

business comes both from the U.S. and abroad. Much of it stems from the purchase of the Cyber 930, introduced earlier this year, Williams said. "Fifty Continued on page 69 Alpha pulls a fast one with 68030

BY JAMES CONNOLLY

SANTA ANA, Calif. - The first computer systems based on the Motorola, Inc. 68030 microprocessor will be shipped by the end of this month, according to Alpha Microsystems, which plans a 68030 product introduction today.

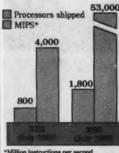
While other vendors, including Motorola, have already scheduled 68030-based systems for deliveries for next year, Alpha Microsystems officials claimed that their firm's AM-3000 series will be the first generally available 68030-based systems

Gary L. Nelson, Alpha Microsystems director of marketing, said the AM-3000 is currently being used at a beta-test site and is available immediately. Nelson said the AM-3000 extends the company's product line by more than doubling the number of users supported on the Motorola

Nelson said the AM-3000 Continued on page 69

Data View

MIPS explosion U.S. installed base of IBM 3090s overpowers that of IBM 3033 at comparable points in product cycle



Harris's Night Hawk system expands real-time offerings

Introduction includes Ada engineering tool set

BY JAMES CONNOLLY

FORT LAUDERDALE, Fla. Harris Corp.'s Computer Systems Division made its first commitment to the Motorola, Inc. 68030 microprocessor with the recent introduction of an Adaoriented family of multiprocessor real-time supermicrocom-

In addition to announcing the Night Hawk family, Harris added software engineering tools to its Ada programming support environment and expanded the realtime capabilities of its MCX family of Unix-based supermicrocomputers and H series superminicomputers.

Harris officials claimed Night Hawk, which was designed to support trainers and simulators and overlaps the lower end of the H series, features up to eight tightly coupled CPUs, each including a 68030 chip and a floating-point accelerator, in a single cabinet.

The company said the memory hierarchy includes on-chip cache, on-board global memory Continued on page 68

Inside

68020-based AM-2000 family.

• Texet offers entry-level publishing system. Page 72.

• Motorola Computer Sysputer to its System 800 family. Page 72.

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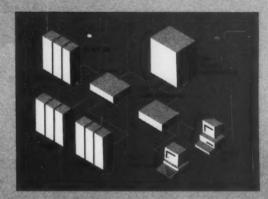




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The Executive Committee people we spoke to off-line don't realize that they're placing a long-term bet on the computer network we choose today. They look at computers in their own shop and figure networks are just the wires that connect them. So before Gail gets into AT&T's ISN, I'll get them thinking. Looking across the table at the grey who's got a DEC* or an IBM system and saying 'Hey, we need a network that can work with just about anybody's boxes. And still be here after some of those boxes are history.' Then Gail presents ISN, chapter and verse. Finally, you get up and remind them of what AT&T's done for us. Our committee may not know combuter networks, but they sure know

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Connolly

been challenged by makers of special-purpose chips, such as those based on reduced instruction set computing architec-

Intel claimed to better the 68020 with the 80386, which has been rated at about 4 million instructions per second (MIPS), and Motorola came back with the 68030 which has been rated at up to 8 MIPS. National Semiconductor, meanwhile, says its NS32532 will run at 15 MIPS.

While the chip makers and their customers in the computer manufacturing community have elbowed past each other for prominence, it may be easy to

lose perspective on what kind of punch these chips pack.

If the 80386 does even half of what some people claim it can and performs 2 MIPS, that is roughly twice the CPU power of the IBM 370/158 that was a standard for mainframes almost 15 years ago.
If the 68030 reaches half of

its potential and performs 4 MIPS, that would place it in the heart of the IBM 3083 family, which was a standard for mainframes just five years ago.

PC not a mainframe

All of this does not mean that a desktop PC or workstation can do what a mainframe could do a few years ago, if only because wiring 500 terminals and printers to an IBM Personal System/2 would be the headache of the century.

But putting 80386 or 68030 power into a minicomputer, whether the CPU is a commodity chip or a proprietary design, means that departments or medium-size businesses can get the quick response times that were missing a decade ago.

It also means those users can think about using complex software packages - such as relational data base management systems — while having enough horsepower to hide the complexity behind the excess MIPS and perhaps making com-puters easy for the end user to

Connolly is Computerworld's senior editor, systems & peripherals.

Harris

cache and local and global memory. The primary I/O subsystem is the 40M byte/sec. Harris

Runs Unix versions Night Hawk runs Harris's CX/RT real-time production operating system as well as the company's CX/UX dual-universe implementation of AT&T's Unix System V and the University of California at Berkeley's Unix 4.2

A basic system with 2M bytes of memory, one CPU and minimal I/O and software costs about \$55,000. It will be available during the fourth quarter of 1988, Harris said.

The Ada tool set, which will be known as the Harris Ada Programming Support Environment for Software Engineering, was designed for all Harris CPU plat-

It includes 26 tools intended to help an Ada designer create, review, manage, document and test software designs. The tool kit is based on an Ada program design language that meets the requirements of the U.S. Department of Defense, according

RT-VOS enhancements

The improved capabilities an nounced for the H series' RT-VOS operating system include increased flexibility for the frequency-based scheduler, enhanced performance monitoring and interactive display and modi fication of variables from any processor in a multiple-proces

sor complex.

The additions to the MCX machines include a real-time operating system and a 68030 upgrade board that can replace the MCX's existing Motorola 68020 CPU.

The upgrade costs \$20,000, although discounts will be available on orders placed before the end of February, according to Harris.

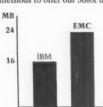


1. Invest in EMC

With the uncertainty surrounding IBM's next move in the mainframe area, adding a few more years to your system's productive life will pay dividends for you down the road. So why buy a new system, when EMC's main storage upgrade gives you the performance you need to make your current system your future workhorse. With EMC you save 30% over comparable IBM upgrades, which means buying time now for your 308X has never been a better decision. The simple "plug and play" design of EMC's upgrade makes improving the performance of your system as easy as adding sand to an hourglass.

Maximize Your Savings.

EMC uses state-of-the-art technology and production methods to offer our 308X upgrade at 30% lower cost than IBM. A 16MB upgrade from



\$160,000 Expenditure

IBM is priced at \$160,000. For that same price you could buy 24MB of EMC main storage. That's an additional 8MB of main storage or a savings of \$50,000. Either way you save with EMC. EMC also features coterminous leases and trade-up credits so the return on your investment continues after your purchase.

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CONTINUED FROM PAGE 65

percent of our business in CDC 930s comes from customers who never before have owned a Cyber machine," he said.

"There are three tiers to our strategy," Williams said. "We like to talk about providing a transparent link between an end user's workstation, the company's general-purpose computer and the supercomputer." That link, of course, is NOS/VE, which will support Unix throughout the CDC line, as well as CDCspecific applications. (Unix support on the ETA-10 is not yet available.) Multiple networking architectures are also supported, including links to Transmission Control Protocol/Internet Protocol, IBM's Systems Network Architecture and CDC's Loosely Coupled Network.

Williams envisions a day when executives, engineers and office managers can link to a variety of mainframe hosts through their PCs. The ability to query IBM's DB2 via SQL is already available, as is the ability to query Oracle Corp.'s relational data base management system. CDC's Engineering Data Library, now called an Environment Management System (EMS), acts as a repository for computer-integrated manufacturing (CIM) drawings and vectorized data.

Technology alienates sales force

That environment may be attractive, Williams said, but it will not be marketable unless the CDC sales force understands it. "CDC has had the ability to produce fast computers, but there really wasn't a mar-keting function here that spent a great deal of time translating the technology to

CONTINUED FROM PAGE 65

supports a maximum of 360 users and that the system could support that many active, concurrent users in applications such as data entry with 3- to 4-sec. response times. He said the AM-3000 is intended to support more than 150 users in general-purpose computing environments.

The AM-2000 series remains available and can be upgraded to the AM-3000 through a 10-minute CPU board swap, ac-

cording to the vendor.

Like the AM-2000, the new systems are based on Alpha Microsystems' AMOS operating system. The company, which claims an installed base of more than 30,000 systems, abandoned a Unix offer-

ing last year.

The AM-3000 uses a 20-MHz 68030 CPU and 32K bytes of on-board cache memory. It is available in three configurations and supports up to 120M bytes of memory and 3.4G bytes of on-line storage. The three configurations include a tower version with six Motorola VMEbus slots and two rack-mount versions with 10 or 21 VMEbus slots.

The systems use a multiprocessor design in which microprocessor-based controllers can be added for tasks such as terminal I/O, disk management and tape

management.

A basic tower configuration costs \$40,000 with the CPU, six slots, 8M bytes of memory, 150M bytes of disk storage, 30 serial ports and an operating system license.

the sales force. We had good products, but we didn't know how to talk about them." Monthly newsletters and frequent seminars have been instituted to counter the communications problem.

CDC has no illusions about being the only vendor at a user's site. "I don't think we are arrogant enough to say to a customer that we are your entire environment," Williams said. He sees CDC's opportunities in the areas of scientific computing, engineering, CIM and DBMSs. Today, two-thirds of CDC's customers are described as "technical" rather than "commercial" accounts.

Aware that it cannot take its installed base for granted, CDC recently undertook a study of its user sites, identifying product requirements and weak areas.

Don Young, a securities analyst with Sanford C. Bernstein & Co., said he believes CDC's mainframe base of some 1,300 is susceptible to erosion and that CDC management is aware of it. "Over the next two to three years, about 20% of these machines are at risk, and about 10% will probably be lost," Young said.

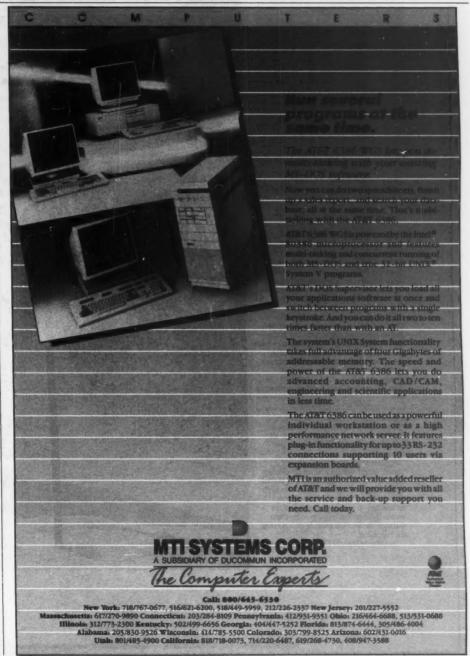
But Williams' strategy of gaining new accounts with scientifically oriented Unix machines and small Cyber 930 processors should rebuild the base, Young said, and the situation should stabilize by 1990. "It should come together for CDC in 1991, when they could be the single largest provider of technical computing systems

Vertical solutions will, in general, be deemphasized - a turnabout from the company's position several years ago.

The only exception will come in the area of energy management applications, or software specific to running a nuclear power plant or other electric utility. CDC already has a significant share of the utilities management market and does not intend to give it up, Williams said.

Finally, customers can expect to see familiar hardware and software packaged with CDC offerings, Williams said.

We intend to keep on top of the programs offered by independent software vendors, because the expertise in any given vertical application does not have to reside here at Control Data," Williams said. "Our fundamental task is to provide the hardware platform and the environment, not to know the customer's business better than he does.



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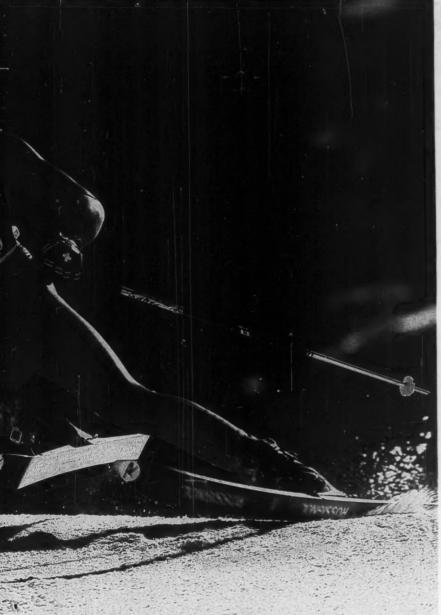
implementation.

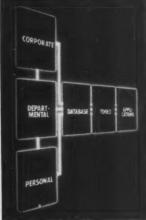
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NEW PRODUCTS

Turnkey systems

An entry-level publishing system based on a Sun Microsystems, Inc. Sun-3/60 workstation has been announced by **Texet Corp.**

The system, called the Live Page 300, includes the vendor's Live Image Elecronic Publishing Software, featuring such document-management capabilities as revision control, point pages and an intelligent table of contents. The software also has an object-oriented, hierarchical data base. The system interfaces to Adobe Systems, Inc.'s Post-

script-compatible output devices.

The LP 300 is priced at \$29,995.

Texet, Box 126, 37 Broadway, Arlington, Mass. 02174. 617-641-2900.

Processors

Motorola Computer Systems, a subsidiary of Motorola,

Inc., has added the **Model 150** super microcomputer to its System 800 family of platform products

Based on the Motorola 68020 operating at 16.67 MHz, the Model 150 features 4M bytes of on-board memory and the AT&T Unix System V, Release 3 operating system.

It has a six-slot VMEbus and supports one fixed disk drive,

one floppy and one streaming tape drive.

Pricing ranges from \$10,000 to \$25,000.

Motorola Computer Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014. 408-255-0900.

Data storage

Half-sized Winchester disk controllers featuring autoconfigurable BIOS, power capabilities for hard-card applications and surface-mount technology have been introduced by Data Technology Corp.

The 5150CR supports up to two 5¼- or 3½-in. Winchester drives in any combination of fixed or removable drives. The 5060CR is a run-length-limited controller that supports up to two similar 5¼- or 3½-in. Winchesters in any combination of fixed or removable drives.

In volume OEM quantities, the 5150CR costs \$50 and the 5160CR costs \$60.

Data Technology, 2551 Walsh Ave., Santa Clara, Calif. 95051.408-727-8899.

Terminals

A business presentation product called the Videoshow Professional System has been announced by General Parametrics Corp.

The system is said to allow a presenter to integrate photographic images and computer-generated images in the same picture. It can produce presentations in video, slides and overheads. Other features include the abilities to synchronize with multiple video sources and to capture, edit, combine, compress and display images.

press and display images.
The Videoshow Professional
System is priced to \$20,000.

General Parametrics, 1250 Ninth St., Berkeley, Calif. 94710.415-524-3950.

Printers/Plotters

Eastman Kodak Co. has enhanced its Kodak Ektaprint 1392 printer, allowing it to merge data from mainframes with files created using the Kodak Ektaprint electronic publishing system.

The Ektaprint 1392 Model
14 printer can be configured
with the Ektaprint 1700 magnetic tape drive operating at
1,600 or 6,250 bit/in. or a highspeed 56K bit/sec. IBM Systems
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(SNA/SDLC) data link.

The data can be transported from the mainframe directly over an SNA/SDLC data link, priced at \$10,500, or indirectly using the Ektaprint 1700 tape drive, priced at \$24,000. The printer costs \$200,000.

Kodak, 343 State St., Rochester, N.Y. 14650. 716-724-1336.



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EXECUTIVE REPORT

COMPUTER CRIMES

To catch a thief: Lessons in systems security

BY MICHAEL BALL

he Puzzle of the Profane Prankster. Fear and helplessness are not feelings typically attributed to systems managers, but those emotions are apparently what a malicious employee wanted to produce and did—at the Calgary Herald in Calgary, Alberta.

Reporters, editors and MIS staffers alike chuckled the first time obscenities filled their screens, but in a shop totally computerized, from writing through production, with a System Development Corp. turnkey newspaper publishing system, the joke quickly lost its edge.

For six months in 1980, the Herald's network was subject to a profane prankster's whims. Obscene messages were embedded in files and in some cases seemed to appear randomly. Editors and managers were powerless, says then-managing editor, Kevin Peterson.

Eventually, the skill of the scalawag and the medium in which he worked were his undoing, Peterson notes. Eliminating network users without the skills for advanced programming quickly reduced the suspect list. Computerized auditing further winnowed down those who entered specific files.

This left a single systems programmer. The motivation appeared to be retribution for a wronged spouse, a former Herald reporter who had had a runin with the city editor. The systems programmer was fired.

The Calgary Herald's run-in with computer crime is not as dramatic as recent multimillion-dollar insider data diddling or hackers' planting of killer computer viruses, some of which are discussed below. But there are lessons to be learned from the

LARRY ASHTO

INSIDE

Why buy a prevention system?

Page 75

The latest in security legislation

Police let computers do the dirty work

Herald's experience — and the experiences of other firms described here.

One lesson the Herald learned was the importance of good management. While many companies might have looked to computer-based preventions, the Herald faced a harder reali-

ty, according to Peterson. "I must admit, it was primarily a management problem," he says. "We should have been able to identify this before it affected our computer operations."

The *Herald* didn't ignore the need for additional security requirements, however. "We add-

ed new levels of security, such as passwords and restrictions on functions various users can perform," Peterson says.

But, as with most computerdependent shops, burdening a publishing system with security measures would have meant destroying the advantages a computer has over pens and glue nots.

"We had to balance security and access," Peterson explains. "If we restricted our people too much, we'd slow down the writing, editing and production. We'd hamstring our operations."

The Herald put the onus of system integrity squarely on management. "You have to hire good systems people and keep them happy," Peterson says. "If you then think you have to put in a whole bunch of safeguards, it's time to step back and say, 'What's wrong with our managers?' " Among the Herald's managers, the key now is keeping an eye on morale. "We actively look for bad apples and figure out the problem," Peterson concludes.

The Ruse of the Rotten Refunds. An imperfectly planned system was too much to resist for the supervisor of the Detroit income tax refund section. For nine months, Ronald Cojoe used his high-level system access and his knowledge of the refund information system's shortcomings to fill his pockets to the tune of at least \$123.000.

The system shortcoming that Cojoe, operational officer in the city's refund department, exploited from Nov. 21, 1984, through Aug. 7, 1985, stemmed from the way computerized files were handled on the department's Unisys Corp. mainframes and the way checks were issued, says Lt. Fred Campbell of the Detroit Police Department.

Refunds were assigned a number by case, not by person or business. Cojoe randomly selected a number, increased the

Ball is a free-lance writer based in Boston.

Thief

FROM PREVIOUS PAGE

amount and changed the name and address to those of one of his three cohorts. Once the check was issued, he changed the data back.

Because his department — in effect Cojoe himself — authorized payments and the treasurer's office paid them, "the books always balanced," Campbell says. If a taxpayer inquired about a refund, the computer would show the check issued and cashed. In addition, because the checks were printed with the case number, a bank calling to verify a large check would be told the check was authorized.

Ironically, according to Campbell, when the crimes were first discovered, Cojoe was placed in charge of the investigation from the tax refund side. "He was still issuing checks during that part of the investigation," Campbell says.

Once Cojoe was removed from the investigation, Campbell, Sgt. Charles McEwen and the tax office uncovered a pattern of payments to a dummy construction company and the three accomplices. They checked identification numbers and found businesses that did not exist and taxpayers who said they never received checks.

"He was caught by a fluke and might not have been except for studiety and greed," says Nancy Alberts, Wayne County assistant prosecuting attorney.

What happened? Cojoe showed up with one of the friends to cash a reissued, manually typed check. The teller called and received an OK, but the income tax division was

alerted to what seemed to be a very large refund for an individual. It was about \$4,000, according to Campbell, while the average refund was about \$100.

Alberts prosecuted the four under racketeering statutes, as Michigan's computer crime laws are so new. The check cashers received probation; Cojoe was given one to 10 years in state prison and ordered to pay restitution of \$123,000. The city also attached his pension.

In retrospect, Alberts adds that she has her own fears of this type of crime. "We catch the stupid ones," she says. "We don't

know how many go undetected."

"It's like the system had neon lights flashing, 'Steal from me,'" says Sanford Sherizen, a Natick, Mass.-based independent computer security consultant, referring to Detroit's income tax refund setup. "The city obviously wanted to make it easy to issue checks — and it certainly did."

The city of Detroit acted quickly to fix the bugs and tighten controls of the system described above. While Ralph Hurte, director of the city's income tax section and Cojoe's

boss, understandably will not detail the fixes, he does say that there are now embedded subsystems that automatically produce reports on use, data changes and operators.

"It's a combination of controls, which are mechanical in nature," Hurte says. "There are also administrative steps concerning who authorizes and who has access."

This type of crime is not at all surprising, and it will get worse, Sherizen says. "A lot of companies will be in trouble when more sophisticated criminals get started."

E HAD to balance security and access. If we restricted our people too much, we'd slow down production. We'd hamstring our operations."

KEVIN PETERSON CALGARY HERALD

The Dastardly Diversion Dilemma. In January 1986, Control Data Corp. spokesman Richard C. Reid announced that employees from its Bloomington, Minn., and Oklahoma City magnetic peripherals arm had been arrested for diverting CDC goods and cash. The crimes were planned around and facilitated by the computerized purchasing and inventory records, which were maintained on CDC Cyber 186 machines.

As much as \$20 million in company and outside vendor equipment had been diverted to dummy companies and sold for profit. In some cases, perfectly good parts and subassemblies were classified as scrap. Employees simply removed the "junk" and resold it, Reid says.

This type of fraud may be a common occurrence today. It is merely a cybernetic version of an old insider scam.

The basics are that a computer operator with access to purchasing or scrap disposal or other resource records fools around with the data. For example, the first step would be to rent a post office box and print bills in the name of a fake company. Next, the victim company is billed for undelivered goods or unperformed services. The operator approves the purchase order and pockets the proceeds.

As with many kinds of systematic thefts, detection most commonly occurs through the various oversight cycles. Some purchasing software pinpoints queer buys. A final check, although it occurs at an expensive time to catch the problem, is the accounting auditing cycle.

CDC is more concerned with the stickier problem of prevention, Reid says. The company is looking to technology but will place more emphasis on education and management, he adds.

"An obvious thing we did was use bar coding throughout manufacturing," he notes. Previously, many small, valuable parts did not have their own identification numbers and could have easily disappeared without leaving an audit trail. Now, if parts become missing between storage or production stages, an exception report is printed.

The company also revised its system on scrap and reclamation of parts and materials. This system, too, relies on unique numbers. "Even individual thin-film heads from each wafer are numbered," Reid says.

Yet, CDC does not look to technology to cover the exposure any more than it blames the computers for the thefts. "It was definitely the human factor, both the workers and managers," Reid admits. Of course, managers up and down the chain of command have been made aware of the thefts and related security problems. They have been taking security courses, and the entire company has undergone a security awareness communications campaign.

While that may help, according to security consultant Jack Bologna of Computer Protection Systems, Inc. in Plymouth, Mich., "there are errors and omissions in almost any system that allow security breaches." In this particular type of case, he said it is plain that "the receivables clerk should never be able to access payable files."

Like other victims of computer crime, CDC is not proud of what happened. Putting the best face on it, Reid says, "If you can say anything positive comes out of an experience like this, [it's] that [you] end up with improvements in security procedures and a heightened awareness of losses."

The Hackers Whodunit. In some circles, computer hackers still enjoy the reputation of folk heroes. But the U.S. government and its prime contractors think less highly of those who trifle with their files, bulletin boards and networks.

Indeed, when young members of the Hamburg Chaos Computer Club (CCC) hacked their way into a variety of European and U.S. corporate and government DEC VAX computers in September, no victim seemed amused. The researcher who lost four months of work when numerical values were changed in his files certainly was not, notes Donn Parker, computer security consultant at SRI International in Menlo Park. Calif

Why did they do it? The pranksters claimed to be doing everyone a favor by pointing out



Mainframe vice

For the fledgling securityconscious MIS director, here are a few lessons in fighting computer crime:

The more DP-dependent your shop, the more vulnerable it is to even a single criminal.

The person most likely to cripple your computer operations is a systems programmer or analyst. Because of his position, this person may be hard or impossible to catch, and the crime may go undetected for months. Systems security measures are all within the criminal's understanding.

Not having any security defense is asking for trouble. However, a pleasant working environment and good management may be better safeguards than any hardware or software precaution.

Getting the security "religion" after the first recognized computer crime is too late.

MICHAEL BALL

the inadequate security of the systems and their software — particularly Unix and the VMS operating systems.

One of the club's targets was the U.S. National Aeronautics and Space Administration, through its Space Physics Analysis Network. The semipublic buletin board offers postflight data analysis for business and school use, and signing up is no easy trick. What the hackers did was bypass the operating system security, read out the password list and plant one or more viruses in the system, says NASA's Douglas Hunt, manager of the automated information security program.

Even though Europeans are terrorism-conscious and have laws and organizations to deal

Continued on page 77

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Security systems: Getting management to shell out

BY LARRY STEVENS

Convincing senior management to shell out the money for a security system can be difficult for MIS. The trouble stems from the fact that although computer crime is a serious problem, it has, by and large, been swept under the carpet.

According to Richard Cashion, assistant director of the D. W. Mattson Computer Center at Tennessee Technological University in Cookville, Tenn., where the security system includes a sophisticated, universitywide password setup, "A lot of upper managers want to try to ignore the problem into nonexistence. They want to keep the illusion that only highly trained technicians are sophisticated enough to do computer crime." He adds that "they also don't want to admit they have a bad system, just as they don't want to admit they have bad management at any level."

Indeed, when a breach of security does occur, it is often considered a reflection on the organization, says Belden Menkus, a Middleville, N.J.-based independent security consultant. As a result, many companies do not press charges, preferring instead to allow the suspected individuals to quietly resign.

Shhh . . .

"Most MIS managers try to keep it hidden from upper management, most upper managers try to keep it from the board, and most boards try to keep it from stockholders," Menkus says.

William Burgess, vice-president of information systems at The Prudential Insurance Co. of America in Newark, N.J., agrees. "The

fact that many companies tend not to widely discuss the incidence of computer crime is a factor making it difficult to get management to buy a system," he says. "Many managers simply do not fully appreciate the dangers involved." Prudential has password systems, which control general access to files as well as usability of functions, installed on its IBM 3090 and 3080 series computers.

In addition, MIS will often find top

In addition, MIS will often find top management turning a deaf ear to proposals for funding of a security system. This, Menkus says, occurs because managers are used to spending money on hardware and software to increase capacity and speed. A security system, however, does neither; in fact, it will likely degrade a system slightly.

"Any security system will cause some delay and some growth of files," Menkus maintains. "It's tough to get someone to spend money for something that does not increase output, that seems to be of little use and that degrades the system."

Yet securing data may be vital not only to the corporation but also to the individual responsible for maintaining the system, Menkus points out. "In too many organizations, the first thing that top management does when confronted by a computer crime is to look for someone to blame. Often, that person is the guy who discovered it."

According to Sanford Sherizen, a Natick, Mass-based computer crime prevention expert, one way to sell a security system to senior management is to point out that they "own the problem." He explains, "If a breach of security occurs, it's senior management, not MIS, who will be held up for criticism."

Sherizen points out that when the Bank of Boston was implicated in money laundering because it accepted large deposits in small bills, "it wasn't the auditowho had to answer to congressional committees, to the press and to angry stockholders. It was the CEO."

Buck BloomBecker, director of the National Center for Computer Crime Data in Los Angeles, a nonprofit research institute, goes further in attributing computer crime responsibility. He says the day is approaching when corporations and may be even CEOs will be held liable for financial loss or loss of privacy that results

from computer crime. "It's something that is now being argued philosophically in law journals," Bloom-Becker explains. "But today's philosophy is tomorrow's practice. It may not be long now before [bank] CEOs are sued because someone has had his private account illegally ac-cessed. And the defense against such a suit is to be able to prove that adequate security equipment and measures



Richard Cashion

were in place '

Sherizen adds that unless security is adequate, it might even be hard to take action against guilty parties. "When someone in the organization is found to have been using the computer for crime, the first impulse is to fire him. But if a data base is not fully protected, the individual can contend he didn't know he was not allowed to access it. Or if audit trails are not complete enough to lead directly to only one person, the individual can later deny committing the crime. He can then sue the company for back wages as well as defamation of character."

Legal problems notwithstanding, in some organizations the only way to sell top managers on a security system is to feed them figures on how much money is likely to be lost in a security breach.

Theoretically, the most scientific way to do this is through risk-analysis software, which uses complicated heuristics to determine the vulnerability of a company. Examples of this product type include Riskcalc from Parkhurst-Spence, Inc. in Washington, D.C.; Riska from Danville, Calif.-based Chesapeake Computer Group; and, from Profile Analysis Corp. in Ridgefield, Conn., Riskpac.

Although these types of programs

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Stevens is a free-lance computer industry writer based in Springfield, Mass.

EXECUTIVE REPORT

come close to scientifically analyzing risk, there is some controversy as to how accurate they are. The problem, Menkus says, is that there is not a large enough statistical base from which to work.

'These programs often start playing around with weighted averages and probability." he explains, "But unfortunately, because there are so few statistics on computer crime, there is little basis for making these estimates.

Because of this deficiency, management may not accept the results of a risk analysis and may instead insist on more down-to-earth numbers - numbers that are not available.

The solution, Sherizen says, might be to use figures for general white-collar crime as a guide to the extent and potential danger of computer crime. "A company normally has strong procedures for protecting against embezzlement and other white-collar crimes. Computer crime is nothing more than white-collar crime with a new medium. Every time you train an employee on the computer. you're also training him to use that computer to rob the company. There is little sense in protecting yourself against white-collar crime without protecting yourself against computer crime.

Perhaps one of the reasons MIS has had a tough time convincing senior managers to take computer crime seriously is that the most publicized examples of security breaches are of young hackers or petty criminals. It's hard to justify spending tens of thousands of dollars to protect yourself against teenagers. But management has to be made aware of the fact that computer crime is much more serious than first assumed.

Tennessee Tech's Cashion declares, "Hackers have gotten the headlines, and that has been a double-edged sword for us. On one hand, it has made management aware of the need for security. But on the other hand, it has caused them to underestimate the magnitude of the problem.

According to BloomBecker, hackers are the least of the problem. "Criminals are being caught that are more organized and more sophisticated than we ever imagined. Cases are now being prosecuted under racketeering laws, and suits are hovering in the multiple millions.

Another argument senior manage-

ment might use to resist purchasing a security system is that the company is already insured against losses. But aside from the loss of reputation, which cannot he insured, as well as the fact that premiums may rise after a substantial loss, there are many other expenses to consider. Most of these are associated with the system being down for a period of time.

As BloomBecker puts it, "A company

cannot insure against lost opportunities and lost customers that result from not having full use of the computer system. Those losses are almost impossible to quantify, but they are important to con-

Swallowing the security pill Obviously, the ideal way to install a security system is to assess the need, budget it and install it all at once. However, it is often difficult to get senior management to swallow the security pill whole.

According to Selby Wellman, vice-president of marketing at Paradyne Corp., a Largo, Fla., data encryption hardware vendor, "It's very rare that we get to install a complete security system in one fell swoop. Normally, we have to



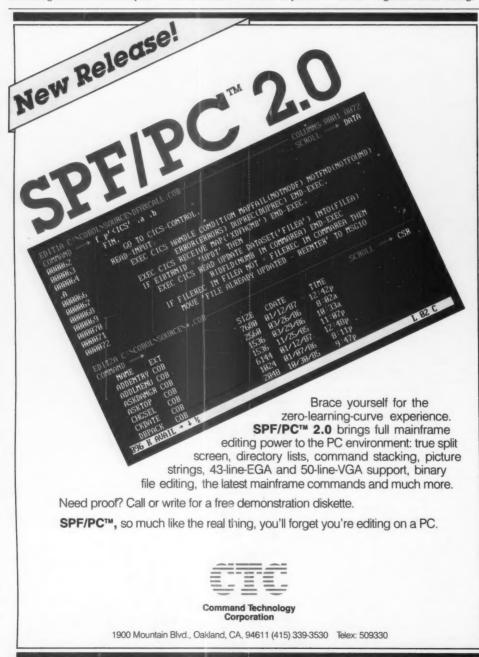
OMPUTER crime is nothing more than white-collar crime with a new medium. Every time you train an employee on the computer, you're also training him to use that computer to rob the company.'

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determine the most sensitive circuits and install machines on those.

The main reason for the piecemeal method is to get a company and its officers used to the need and efficiency of security systems. "Going to password is a step you have to take all at once," Prudential's Burgess says. "But after that, you can increase the sophistication of the system gradually. Probably if the money spent on a security system in Year X had been defined five years earlier, you would have had a hard time getting the system approved." A second reason for gradual implementation might be that MIS needs to avoid exceeding its spending authorization for the year.

However it's accomplished, most consultants say that corporate managers need extensive education on computer crime and security. And at this time, the group best positioned to furnish that education is MIS. •



Thief

FROM PAGE 74

with computer crimes, CCC was detected and identified by a technician at the European Center of Molecular Biology.

Various parties involved in the CCC scam place the blame differently. The hackers held a press conference to finger the operating systems' defects. Many of the companies and agencies involved admit they were lax in their security measures, relying on those in Digital Equipment Corp. VMS and Unix.

NASA's Hunt says, "There was a serious hole in VAX/VMS Releases 4.4 and 4.5." He was involved in helping discover the reason CCC was able to change files. Apparently at least one of the hackers was familiar enough with the operating system to defeat the password/function restrictions in VMS.

DEC's latest two VMS up-



Detroit Police's Campbell

grades fix those security problems, Hunt says. "At least in this one area, I think we're covered," he says.

In addition, NASA tracked down the viruses the hackers planted in the network. It is still checking for others and has ordered a reload of programs from original disks to replace those on-line during the time the network was illegally accessed.

As for the hackers, the West German and French authorities are prosecuting them under computer-crime violations, according to West German newspagers.

The Case of the Concerned Crank. A poem, a pansy, a bag of Mrs. Fields goodies and a message, "Please have a cookie and a nice day," are what she left — along with five demolished IBM mainframes.

On a Tuesday early this June, free-lance peace activist Susan "Katya" Komisaruk walked into a low-security area at Vandenberg Air Force Base in California. She does not deny that she then broke a window to enter a building and took a crowbar, wire cutters and then a fire extinguisher to the guts of five computers, according to Federal

Bureau of Investigation and Secret Service agents in both San Francisco and Los Angeles.

Komisaruk told the agents she thought she was hindering the Star Wars effort by selecting the "NAVSTAR Control Center." However, the U.S. Air Force had not taken down the old signs from what is now a storage building.

After she turned herself in,

Komisaruk was prosecuted by the state of California for trespass and destruction, reports the state prosecutor's office in Los Angeles. She was convicted on Nov. 16 and could be sentenced to up to 10 years in prison.

This type of crime should be meaningful to many MIS managers, particularly those who do not have a lock on their computer room doors. Komisaruk might well have escaped scot-free had she not been determined to make it plain what she was about. She walked away from the wreckage, hitchhiked home to San Francisco from Los Angeles and turned herself in to the authorities.

The Air Force, surprisingly, is quite sanguine about it all. According to spokesman Lt. Col.

Richard Hill, the important thing is not the expensive mainframe destruction but that no damage was done to data. He says the computer system was obsolete and unused. "Eighteen months ago, that was a NAVSTAR installation," he points out, "but it was storage when she got in."

The Air Force's position is that it was not incredible that Continued on page 88



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On Capitol Hill, loose chips sink ships

BY BUCK BLOOMBECKER

While lacking the immediacy of the Bork hearings or the banality of the new television season, Washington, D.C.'s, fall season for computer security promises to be one of the more memorable of recent times.

Recently I scoured the halls and corridors of Washington, hunting down both obscure and well-known members of the legislative and executive branches, to ascertain what they were doing to help make the nation's computers secure.

Don't let it be said that all in our nation's capital are asleep at the keyboard. A number of significant activities are about to conclude, and others to begin, making Washington the place to

HE government puts information security under the heading of information resource management. From office to office, IRM reigns as a buzzword. But what it means is harder to pin down.

watch for computer or security professionals curious about where federal computer security policy may lead them.

The main event: HR 145

Clearly the most significant piece of business on the computers security calendar is the fate of HR 145, Rep. Dan Glickman's (D-Kan.) bill. It is the latest volley in the continuing debate over the relationship between the National Bureau of Standards (NBS) and the National Security Agency in the development of computer security policy for the federal government.

As passed by the U.S. House of Representatives [CW, June 29], HR 145 says the NBS is to have primary responsibility for the development of computer security for all systems handling unclassified information. The bill has been modified slightly since Glickman introduced it so that it now recognizes the appropriateness of the National Security Agency's providing technical advice to the NBS.

Yet to be considered in the U.S. Senate, the bill will die unless the Senate takes action by the end of 1988.

Governmentwide support Strong support for the thinking behind HR 145 is likely to be found by those who read "Defending Secrets, Sharing Data," a recent report from Congress's Office of Technology Assessment (OTA) on federal computer security policy.

The NBS also supports the bill, suggesting that it will clarify the powers and responsibilities

the NBS has held for some time in setting standards for computer security.

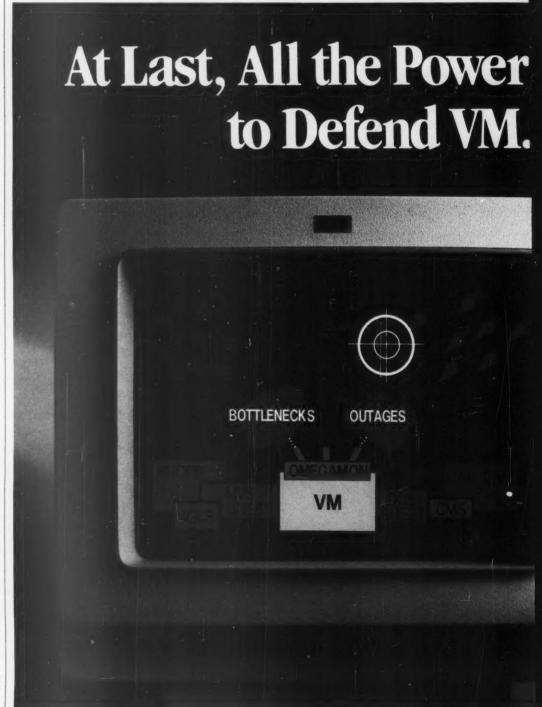
The NBS continues its efforts to guide the nonmilitary user community on computer security. Stuart Katzke, chief of the computer security division of the NBS's Institute for Computer Sciences and Technology, is heading a new project designed to increase the spread of computer security information between government and private-sector participants.

The Computer and Telecom-

The Computer and Telecommunication Security Council is currently in the planning stage. Shirley Radack, assistant to the director of the institute, says

they hope to have it organized by March 1988. The council will provide a forum to look at the issues involved in the protection of nonclassified information.

The General Accounting Office (GAO) is also involved in several studies at Glickman's request. The purpose of these studies is to determine the current status of government computer security efforts and



EXECUTIVE REPORT

evaluate alternate strategies.

The GAO's most current evaluation of the strategies involved in the HR 145 debate can be found in the testimony of Thomas Giammo, associate director of the Information Management and Technology Division of the GAO. That testimony, which was delivered at an HR 145 hearing that Glickman held May 19, discussed the information security practices of nine federal agencies and found a pressing need for improvement in many of the systems consid-

A detailed report is being prepared by the GAO that will discuss the 17 agency systems that are actually reviewed. The report is currently under study, and no release date has been determined.

Underlying these questions, a senate staff aide notes, is a philosophical dispute: Is information simply a type of personal property requiring increasingly stronger walls around it, or is it an individual right requiring different form of protection? This question, addressed somewhat in the OTA report mentioned above, remains to be more thoroughly discussed.

The government puts information security under the heading of information resource management (IRM). From office to office. IRM reigns as a buzzword. But what it means is harder to pin down.

Agreeing to disagree

Deborah Smith at the Office of Personnel Management (OPM) is in charge of teaching computer skills to government employees at the OPM's Washington, D.C., facility. She notes that OMB Circular A-130 mandates that each agency develop a plan for enduser training in information resource management. She attended a conference a year after the circular came out and found no operative definition of information resource management available at the time. She reports no progress since.

With this lack of agreement as to the ground rules, it is not surprising that little is being done to plan for personnel competent in computer security skills, should HR 145 become law. The bill would require the OPM to engage in continued training to keep employees knowledgeable in security. Nothing is currently planned. Smith says, as far as she is aware.

Appendix III to OMB Circular A-130 establishes a set of minimum controls to be included in federal automated information systems security programs. At the end of this year, OMB will receive reports from the managers of the various federal systems on their progress in complying with the circular.

S INFORMA-TION simply a type of personal property requiring increasingly stronger walls around it, or is it an individual right requiring a different form of protection?

Gail Shelton, assistant to the U.S. Department of Health and Human Services (HHS) Inspector General Richard Kusserow, reports that the latest in the HHS's series of studies concerning computer security will soon be issued.

This report, "Personnel, Suitability and Security," pursues the question of the level of personnel security in the HHS. A survey of the 41,644 people in the HHS with access to money or benefits showed that 1,265 of them had arrest records. Onethird of these had theft arrests. 131 had theft convictions.

Meanwhile, the Small Business Administration (SBA) is set to release a computer security guide for the small businessman. Rep. Ron Wyden (D-W.Va.), sponsor of the bill that led to the security guide, is holding a hearing to publicize the guide's publication. The hearing is also intended to publicize IBM's participation in a joint venture with the SBA to teach computer security and computer applications for the small businessman. Rick Mayronne, SBA project director, says 200,000 copies will be printed. •



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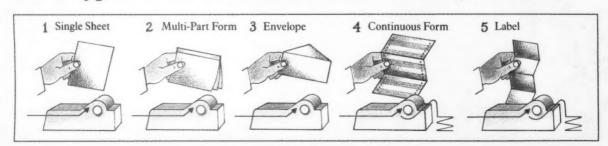
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Software applications put the 'byte' on crime

BY JACK BOLOGNA

rime detection is mainly a deductive process. There are times, however, when police have to rule out more than 10,000 suspects in order to come up with one that may or may not have committed a crime.

This process of elimination is tedious and time-consuming and the kind of thing a computer can do faster, more accurately and perhaps with less bias than humans

Detectives, therefore, are turning over an increasing amount of their investigative duties to computers so they can be free to pursue more important tasks, such as planning the investigations, locating and interviewing witnesses, interrogating suspects and searching for evidence.

Software applications that facilitate crime detection and investigation are currently hitting the market with some frequency. Designed originally as inhouse solutions by local police departments, some of these can now be pur-

Bologna is assistant professor of management at Siena Heights College in Adrian, Mich., and president of Computer Protection Systems, Inc. in Plymouth, Mich. chased, licensed or exchanged

Some 20 organizations provide software to police agencies for crime detection and investigation, traffic safety, departmental budgeting, payroll, scheduling, dispatching, report writing, property accounting, word processing, training and personnel records. With a \$5,000 budget for a personal computer Compile crime incident data on the basis of modus operandi. These applications are intended for specific types of crimes, such as burglary, rape, robbery and car theft.

 Compile lists of criminal associates, their common interests, haunts and criminal specialties.

• Compile lists of aliases or street names

not come without some criticism.

There is fear in the minds of some people that the use of criminal-profiling aids touches on the violation of privacy rights. Some people are concerned that profiling can lead to the categorization of people as associates of criminals when the contact was, in fact, innocent, familial or accidental.

These privacy issues concern professional law enforcement agents, as well. Their answer is that great care is taken to safeguard such systems and their data bases in order to ensure that access is restricted to those who have a real need to know.

As the automation of crime detection and investigation grows, police users groups are forming to promote computer usage and software exchange.

One such group is Public Safety Micro-Software International, headed by Doug Johnson of the Madera, Calif., police department. Johnson reports that for a modest annual membership fee of \$105, members receive a newsletter and exchange copies of software that various police departments have developed.

Another such contact is Bill Clede, who serves as technical editor and a regular columnist for *Law and Order* magazine in Wilmette, Ill.

ETECTIVES are turning over an increasing amount of their duties to computers so they can be free to pursue more important tasks, such as planning investigations, locating and interviewing witnesses, interrogating suspects and searching for evidence.

and some software applications, even a small town can modernize its police department.

What are crime detection applications intended to do? The following list is a sampling:

Compile lists of stolen cars, securities, credit cards and other property.
 Compile lists of wanted criminals hail.

 Compile lists of wanted criminals, bail jumpers and delinquent child-support payers.

 Compile lists of counterfeit securities and credit cards. used by criminals.

 Compile lists of fingerprints, signatures and criminal histories of convicted criminals.

- Link certain crimes with certain criminals by establishing common threads, such as common associates, convictions, modi operandi and physical characteristics.
- Telephone toll analysis.
- Movement analysis.

As you can imagine, these advances in police computing's state of the art do

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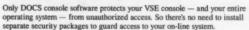
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EXECUTIVE REPORT

Thief

FROM PAGE 77

Komisaruk got on the base, in the building and away undetected. Hill notes that a major highway bisects the base and "after all, Vandenberg is 98,000 acres."

He adds that security on the base is in direct proportion to the nature of the project. High security at the Air Force base involves fences, armed guards, locked doors, codes to punch in — all before you can even touch a computer, which will have its own set of security procedures, Hill says

Regardless of all that, Hill adds that Vandenberg has reassessed its security procedures in light of the incident. "We are in that business," he says.

The Insidious Insider Intrigue. If you cannot trust your bankers — internal and external — what's a multibillion-mark company to do? Yet, Volkswagen AG in Wolfsburg, West Germany, operated as most multinationals do and trusted its internal currency traders and the contracts from its major banks. Computerization is the key to keeping a profitable money spread in international markets, and traders and banks are the professionals that allow quick response to rising and falling currency.

What happened at VW last spring is that traders saw their chance to play with a few dollars — \$259 million, to be exact — in currency futures, according to nu-

merous articles in the daily and business presses. The crime befit the size of the company. It required double insiders — traders and programmers.

On the computer side of the fraud, trading programs had to accept a much looser set of exception criteria for trading. Also, recordings of the actual transactions were erased. Nontrading managers could not be alerted to discrepancies until profits built up. On the more traditional side of the fraudulence, contracts allowing trades through the National Bank of Hungary were forged.

As long as the contracted currencies went the right way, VW profited and the conspirators skimmed off their portion, according to a report from an outside auditor VW hired to analyze the crime. How-

ever, fluctuations in the U.S. dollar skewed the outcome. The schemers cashed the contracts, and VW took the loss. VW will not reveal the exact nature of the problems or their fixes.

Audits eventually uncovered the discrepancies in the VW case. First outsiders and then insiders were identified and sued or arrested. The chief currency trader, Burkhard Junger, confessed complicity and admits forging the contracts. He was fired. But VW's Chief Financial Officer Rolf Selowsky took the fall.

The prosecution continues, with at least three VW currency traders indicted. In September, the courts dismissed VW's claim that the Hungarian bank was at fault, and, according to reports from the Wall Street Journal, it appears VW will have to swallow the losses.

How did it happen? Neither VW America nor its headquarters is willing to talk until the various criminal and civil trials are over, but it is clear that the management and computer control systems were inadequate. The crime may be the largest corporate fraud ever.

Consultants say that such insider manipulation of programs and data requires



Air Force's Hill

considerable and varied defenses. The first is exception-reporting software that tracks all financial transactions and regularly reports those exceeding limits to management. The need for this type of measure seems to be well recognized, and an increasing number of vendors offer such programs to be installed in corporate computers.

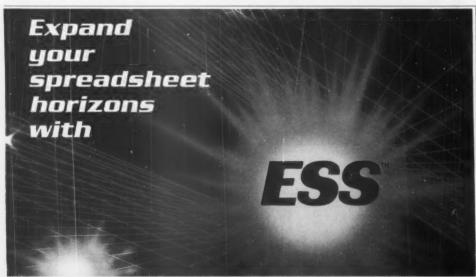
That type of product may well have caught crime similar to VW's — albeit on a smaller scale — earlier, but VW's clever inside/outside combination was willing and able to bypass such safeguards. In such situations, the best deterrence may be to let white-collar employees know that a variety of audit and overlook capabilities are in place.

Besides discrepancy reporting, such

Besides discrepancy reporting, such measures include automatic verification

and recording of who is accessing which files when. Numerous companies provide logging software, although even these aids are not always used to advantage, according to security consultant Bologna. He recalls a new client who had years of

such records yet never examined them.
Bologna cites security monitors from
Absolute Security, Inc. in Maynard,
Mass. The Intel Corp. 80286-based systems link to mainframes or PC networks.
They record who enters what files when
and can be programmed to check for specific types of alterations. In some cases,
this means comparing the contents of the
payroll file with a predefined set of data or
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EXECUTIVE REPORT

security manager would be alerted when certain types of changes were made.

While VW is not talking at this time about specific preventative measures it is taking, Bologna notes that the company had better look to the right kind of technological fixes. "Volkswagen could have adopted exception-reporting software that gives the system a chance to audit itself," he says. For a huge company, this procedure must include user profiles, with immediate reports when these get out of sync. "Ultimately, the system has to start auditing itself," Bologna says.

The Call-Code Conundrum. Last July, the Santa Clara police and the U.S. Secret Service arrested and ultimately charged Paul Lindahl and his assistant with stealing 800 telephone authorization codes from U.S. Sprint Communications Co. through the company's Unix-based systems. The Secret Service says Lindahl subsequently discounted and sold the code use to unsuspecting customers. He called his fake service California Discall. The agencies estimate the loss to Sprint at \$5 million.

The illegal codes were rotated daily, making detection harder, according to police files. The scheme was revealed when Lindahl's operation solicited Sprint customers, who, in turn, notified that company, Secret Service agents say.

The basic ploy in this crime is all too simple. An adult DP pirate or even an unsophisticated teenage hacker need only a PC, a modem and a telephone line.

The system is set to dial codes on the long-distance service's access line. Eventually, it gets a dial tone, or as they say in the trade, "jackpots a number." Various law enforcement agencies and security consultants estimate that U.S. companies lose \$500 million annually by such fraudulently obtained codes.

Sprint recently wised up to these schemes, and people hacking on its service will now get far less return on their time and money investment. Some relatively simple technological fixes may limit the trafficking in authorization codes.

One of the simplest measures, which uses old math, may be the most effective. Sprint is changing its seven- and nine-digit user codes to 14-digit ones, except in a few regulated locations in which they must get permission to do so. Like adding numbers to a safe's combination, this will require a great deal more computerized dialing for a jackpot. Whereas an untended dialing PC might produce dozens or even hundreds of codes in a session when seven to nine digits are used, the longer codes may yield only one or two jackpots — possibly too low a return on investment for pirates.

"We're going beyond getting away from our old authorization codes," says Sprint spokesman Syd Courson.

To counteract the image of Sprint as an easy hit — when initially asked about the hacking of codes, Courson's immediate response was to ask which incident — he says the firm is prosecuting pirates and trying to publicize the fact. Unlike banks, which will not discuss these incidents and would rather fire culprits than prosecute and draw attention to themselves, Sprint wants to scare code thieves.

"Some of those people are already serving time, and we are cooperating with ongoing investigations, mostly with the Secret Service," Courson says. "We want them to serve jail or prison time. Whenev-

er we can, we're starting civil actions as well and going after their pocketbooks."

A Secret Service agent involved in a number of such cases says there is more than just a code problem. "AT&T has maybe 90% of the business and only 10% of the fraud," says San Francisco-based Richard McDrew. "That's no accident. They have internal control on how they issue numbers."

McDrew adds that, typically, such security breaches can be traced to management. "In the Lindahl case, there were problems in their applications procedures and how they gave out numbers," McDrew adds.

As for the passwords themselves, they are essential but not adequate by themselves, says Frank Smith, co-director of

security services at Ernst & Whinney in Cleveland. For internal users, he suggests that passwords be combined with other technologies, such as keyboard dynamics, hand or voice prints or retina pattern recognition.

"In openly architected systems, the fundamental problem is ensuring that the user actually is who you think it is," Smith says

In dial-in systems, Smith cautions companies that "passwords are only alphanumerics of fixed length and take merely repetitive penetration to jackpot." He states that "the very least a dial system should have is three invalid tries and suspend the log in."

Bologna notes that "only those organizations that have been recently and badly

burned are up to date." Buck Bloom-Becker, director of the National Center for Computer Crime Data in Los Angeles, adds, "There is an enormous spectrum of security consciousness from the banks, on one end, to startup companies on the other."

It is up to each individual company to maintain that balance between ease of use and security, BloomBecker says. "There is also a spectrum of prevention, with the expectable trade-offs in ease of use."

However, BloomBecker is quick to point out that in some cases, such as with systems programmers or autonomous information workers, there is no such thing as total security. "The best way to prevent computer crime is still good management and happy workers." •

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IN DEPTH

'Let's see, word publishing, desktop processing — no . .

It used to be simple enough to tell them apart

BY IEFFREY SUTTON

nce upon a time, there two markets: word processing and desktop publishing. Word processing let secretaries and writers type in and edit words with varying degrees of sophistication. Desktop publishing allowed graphic artists and designers to mix text and graphics.

And the two markets lived happily ever after. Right?

Wrong. Word processing and desktop publishing are croaching on each other's territory. With the increasing sophistication of personal computerbased word processors and the proliferation of laser printers, the distinction between wordprocessed and published documents is considerably blurred.

It used to be simple enough to distinguish word-processed from typeset documents. You could print a word-processed file on a daisywheel or dot matrix printer or have it typeset. If so inclined, you could embed complicated typesetting codes in your text files and send the files directly to a typesetter.

Desktop publishing used to mean using a 512K-byte Apple Computer, Inc. Macintosh bundled with Apple's Laserwriter and embellished with Aldus Corp.'s Pagemaker.

The operative words are "used to." As laser printers As laser printers dropped in price and word processors added drivers for them, end users, with these tools alone, began to produce near-typeset-quality documents, com-

plete with graphics. Thus ended the fairy tale of two separate markets.

Word processing is still the technology of choice for the majority of users; its market is large and mature. The market for desktop publishing is modest, but it is growing rapidly, espe-cially when you consider that it emerged as late as 1985, when Apple released the Laserwriter and the Mac 512K (see story page 91).

The number of word processing packages sold has remained relatively stable for the past four years, hovering close to the three million mark. By contrast, the estimated number of desktop publishing software packages sold in 1987 ranges from 137,000 to 250,000 units, according to estimates by Dataquest, Inc., based in San Jose, Calif. This market has doubled each year since 1985 (see charts

But as the boundaries continue to blur, it soon will be tough to count the units sold separately. George Elgar writes in his "Micronews/Views" newsletter that he expects the next desktop publishing sensation to be Wordperfect, a word processing package from Wordperfect Corp.

Trading places

What does all this mean to users? For one thing, it means that many word processing packages now offer features comparable to those of Pagemaker on the Macintosh. Today, high-end word processors offer a variety of fonts, the ability to mix text and graphics, multiple columns. style sheets and other advanced features commonly associated with desktop publishing.

Arlene Karsh, director of publishing systems market analysis at CAP International, Inc. in Marshfield, Mass., says word processors are moving toward better management of fonts. better integration of graphics and better integration scanned images."

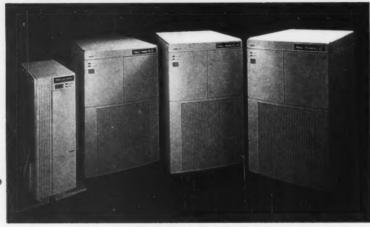
Karsh says she is seeing in PC-based word processing the "ongoing addition of publishing attributes hyphenation. fonts, graphics, images, style sheets and structured page lay-

In a parallel movement, Karsh says, she sees desktop publishing packages enhancing their word processing features by adding spelling checkers and

- Sutton is a free-lance writer based in Warwick, R.I.
- Boundaries have begun to blur
- Is 'dynamic overlap' good for customers?
 - Give end users the kerning test

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better facilities for inputting and editing text. Each raids the other's cookie jar, resulting in "a lot of dynamic overlap between the two," she adds.

In a recent end-user survey. Karsh reports, "we found a lot of people who said they were doing publishing, particularly of long documents, and they were using Microsoft Word to do it.'

Word processing will continue to permeate the desktop publishing realm — heralding good news for end users. The battle between word processing and desktop publishing vendors provides end users with products of better quality at a lower price. Such healthy competition raises performance and lowers cost in true market-driven style.

'Very concerned' Are desktop publishers after a piece of the word processing market's pie? They say no. Nor do the word processing vendors admit to being after the desktop publishers' market.

Despite these claims, Dataquest analyst Richard Young says word processing vendors are nervous about the competition from desktop publishing and that they are fighting to protect their market.

"I think high-end word processing vendors are very concerned about having their lunch eaten by these other products,' Young says. In his opinion, these vendors are afraid of being perceived as no longer being on the leading edge of their own technology.

High-end vendors' fight to re tain domination will lead to further market confusion, with every word processing vendor trying to jump on the desktop publishing bandwagon, Young claims. "The word processing vendors are going to tend to confuse things as much as possible,' he warns, "by showing output that looks like what comes off a

desktop publishing product. Marketing [literature] is going to say, 'We do desktop publish-

Who's to blame?

What is the catalyst of this confusion? The mighty laser printer, the spearhead of the desktop publishing revolution. Because the print quality from word processing and desktop publishing

Rising star

Sales of desktop publishing packages for PCs have more doubled each year in North America



programs can now look identical, it is difficult for users to differentiate among packages.

Ronni Marshak, managing editor at Patricia Seybold's Office Computing Group in Boston, surmises that "a lot of users who thought they needed desktop publishing will find they don't (see story page 92).

According to Young, disorder also stems from end users' lack of knowledge of the fundamental characteristics of the task they are trying to automate.

Young tells a story of wrestling with the first release of Pagemaker in 1985 while working as a systems analyst at Boeing Computer Services in Se-

attle. Why the struggle? He had chosen the wrong tool: The Boeing documentation project required using a book-oriented program, not Pagemaker's page-oriented approach.

Where does the blurring of applications leave the end user in terms of buying decisions? The answer varies according to the users' current software and hardware bases, the investment in employee training, the skill level of employees and, not least, the kind of output required.

Some end users require full desktop publishing packages; others' needs can be met by high-end word processors, Commonly, a company will use several products.

D. L. Hiller & Associates, Inc., a systems integration and consulting firm based in Sterling Heights, Mich., uses both word processing and desktop publishing extensively to produce documents for its clients. President Dean Hiller reports that his company uses Microsoft Corp.'s Word and an AST Research, Inc. Turbolaser printer to produce proposals for clients.

In addition, the company has standardized on Microsoft Word for correspondence and other kinds of writing.

When Hiller needs high-quality documents fast, word processing is his choice. When he needs a high-quality document with complex graphics, he turns to desktop publishing. Hiller says Ventura Publisher from Xerox Corp. would be far too slow to run off four quick proposals for a client. The proposals are standardized and, therefore, contain about 50 pages of boilerplate information.

But for presentations, Hiller says, his firm relies on Ventura Publisher. Users create diagrams of terminals, PCs and network components with Autodesk, Inc.'s Autocad, then call them up in Ventura Publisher and add text, titles and subtitles.

Hiller cites Ventura Publisher's two primary advantages as being the ability to pull in these graphical inputs from an array of sources and the ability to crop the graphics to the right size.

Nancy Carlini, MIS manager at FNS Sales, Inc. in Rochester, N.Y., says her company produces technical manuals using NROFF, a popular Unix page-formatting system from AT&T Information Systems. At the same time, the company is moving toward in-house desktop publishing. FNS currently uses Apple Macdraw-like packages on IBM Personal Computers to generate page layouts for advertisements. These are then sent to an outside ad agency for typesetting.

Carlini notes that her company's move toward desktop publishing will not exclude word processing. "End users are allowed to use what they want," she says. They currently run word

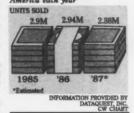
processing packages, including Wordperfect and Micropro International Corp.'s Wordstar on an AT&T 3B1 system.

As integrated as I wish'

Hiller dismisses the notion that the word processing and desktop publishing markets will merge, claiming that an integrated sys tem of sorts is possible right now by doing production work in Word and then loading the documents you wish to enhance into the Ventura Publisher package.

'When I stand there with Microsoft Word on the shelf and Ventura Publisher next to it," he says, "I feel I'm about as integrated as I wish to get.

Cash cow Personal computer-based word processing software is a hefty, stable market – nearly three million units are sold in North America each year



Dataquest's Young says word processing and desktop publishing should remain separate. would rather see a hot link between the composition package and the source file," he says.

While only rudimentary links are available now, the day is not far off when sophisticated links will allow end users to transfer files between applications with no loss of formatting, thus providing true multitasking capabilities. Loading separate applications, such as the graphics editor and the data editor, into memory will "low each module to operate under a single umbrella, providing a consistent level of interactivity

Word processing's pluses Most industry observers say end

users will make use of both kinds of software, using whichever is

more appropriate for the task at hand. However, word proces ing packages have a decided advantage in several respects:

• There is a huge installed base of word processing users. Many companies have a major stake in word processing software, both in existing data bases of text and in training. For this reason, many firms will continue to rely on their word processors and just add laser printers.

· High-end word processors are mature, strong offerings, Peter Dyson, editor of "The Seybold Report on Desktop Publishing," says that "the very finest word processors have functionality that, in some respects, is better than desktop publishing.

Besides being able to perform basic page layout functions such as arranging text in blocks or columns and incorporating graphics, word processors feature the speed and solid text-editing functions missing from most desktop publishing programs.

Word processing software can be easier to use than desktop publishing software.

· Most of the top desktop publishing systems have links, albeit rudimentary, to the high-end word processors.

Office automation key

Perhaps new markets emerge and both markets will win. The office automation market is one key to this outcome.

Young says, "The distribution capabilities offered by office automation tools are going to provide a vehicle to facilitate the movement of information between desktop publishing and word processing.

As Young envisions it, a document would travel along an electronic nath. At each workstation, various writers, editors and graphic artists would add value. The vendor that can be the sys tems integrator stands to profit considerably. "I think that's why Wang, DEC and IBM are now all in this market," he says, "because they see themselves as providing that hub."

Users would benefit tremendously, should such a seamless approach be realized. "Interoperability is a strategic, corporate

One good Apple

hen it comes to desktop publishing, the Macintosh is usually the apple of users' eyes. Apple Computer, Inc., with the Macintosh and Laserwriter, continues to be perceived by many as the desktop publishing company of choice. It is common to find a few islands of Macintoshes in a sea of blue.

For example, Joseph Giamelli, vice-president of MIS for Toys R Us, Inc., says his firm uses IBM's Displaywrite 4 because "it gives us the ability to interconnect around the world." He reports ongoing desktop publishing experiments in composition and layout in his company's Canadian offices. Their computer? A Macintosh, of course

Users choose Apple for its ease of use and software capability. Dataquest, Inc. analyst Richard Young says, "The Mac still has about an 18month edge on the MS-DOS world. If they play this to their advantage, they will continue to do very well."

By contrast, he continues. "IBM can make lots of mistakes. But Apple could be dislodged very quickly by making a few stupid errors

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imperative," echoes David J. Becker, manager of automation resources at Boeing Support Division in Seattle, a separate operating company of The Boeing Co.

Note the difference

Most observers agree on the features that distinguish the two types of software and those that make one more appropriate for a particular task. Text entry and editing form the core of word processing, with a myriad of authoring tools such as a thesaurus or spelling checker thrown in.

The consensus among experts is that desktop publishing software generally includes a "what-you-see-is-what-you-get" (WYSIWYG) display, the ability to mix text and graphics, precise control of page layout and such typographic niceties as kerning, reverse faces, dropped caps and horizontal and vertical rules.

Dyson notes that whereas both desktop publishing and word processing can integrate text and graphics on a page, what differentiates them is the degree of sophistication of typographic control. "Typically, word processors don't have too much concern for kerning, variable point size or variable leading," he says. When they do offer these features, the increments between sizes constitute "fairly crude jumps," he adds.

Two kinds of publishing

The buying dilemma does not end with deciding on desktop publishing over word processing. Just as there are clear differences between word processing and desktop publishing systems, there are also different types of products in the desktop publishing market.

Dataquest's Young divides the desktop publishing market into two camps.

The first is the page-layout approach as epitomized by Aldus's Pagemaker, which uses the cut-and-paste metaphor of the designer as its interface. This is a "to-tal graphics environment, very fluid, not line-oriented," he says. The second, Young continues, is typified by Ventura Publisher, with its "tag-based or designator-based approach providing you with a true structured document."

Pagemaker excels at laying out single pages with great typographic precision, whereas Ventura Publisher is the tool of choice for long documents, such as technical manuals

As if that were not enough, there is a hybrid type: compound document processors. These packages — half word processor, half desktop publisher — mix text and graphics, and they can produce very long documents.

It is in the gray area of compound-document processing that the lines separating word processing from desktop publishing truly vanish. And it is here that users may be confused as to what product

lishing truly vanish. And it is here that users may be confused as to what product they need. Likewise, it is in this band of the market that the high-end word processors and desktop publishers may meet head-on

Products such as Ventura Publisher qualify as compound-document processors, but, interestingly, so do several high-end word processors, including Microsoft Word Version 4.0 and Lotus Development Corp.'s Manuscript.

It all depends on how you define "long document." Jeffrey Sanderson, a product manager in the applications group at Microsoft, defines a compound-document processor as a product that handles long

Continued on next page

In publishing, it's the look that counts

o most users really need desktop publishing packages? Richard Treitman, director of document products at Lotus Development Corp., tells the story of a retailer who asks customers if they need kerning. If their response is, "Huh?" then he does not sell them Ventura Publisher from Xerox Corp. or Aldus Corp.'s Pagemaker.

A factor driving the proliferation of desktop publishing is a change in people's esthetic perception, largely due to the entrance of the laser printer.

Bob Hicks, marketing manager at Norwell, Mass.-based Serono Diagnostics, Inc., a \$35 million business serving the clinical market, says two-column output lends credence to documents because it gives the look of scientific journals.

"I can type something up and put it on stationery, and it can be scientifically valid as hell, and people don't look at it," he says. But when he produces the same document with desktop publishing tools, Hicks claims, people will at least read it and judge it on its scientific merits.

Allan Ayars, manager of desktop publishing product marketing at Xerox, says, "Desktop publishing becomes a very powerful finishing tool because it makes a document 'decisionable.' Management has both summary and detail built into the same document."

JEFFREY SUTTON



Which one's the artist here?

esktop publishing is now sophisticated enough to allow any end user to create complex page formats, complete with graphics. While this pleases some users, it distresses others.

From a management viewpoint, as analyst Rick Young at Dataquest, Inc. puts it, "You may have writers that like to diddle around with those things, but you don't want them to.

Arlene Karsh, director of publishing

systems market analysis at CAP Inter-national, Inc., asks, "Do people creating documents want to deal with formatting? Or is it not their job just to write?

Not all managers view the availability of desktop publishing tools with foreboding. H. William Howard, vice-president of information services at Bechtel Power Corp. in San Francisco, reports, "We've got secretaries using these packages with no training. Give it to them and let them play with it," he says.

Of course, some writers are devoted to their word processors. John Hild, president of Xyquest, Inc., maker of Xywrite III, says that package's popularity stems from how it can be tuned specifically to the task of authoring.

Jeff Sanderson, product manager in the applications group at Microsoft Corp., agrees. "The production people are the ones that should worry about graphic design," he says.
IEFFREY SUTTON

Desktop

documents that need to mix text and

While 50 pages typically constitutes a long document, page length alone is not always the determining factor in using a compound-document processor. The extent to which you must mix text and graphics bears equal consideration.

At present, Sanderson says, a long document such as a 1,000-page manual for the Boeing 747 would require a sys-tem like Interleaf Corp.'s Interleaf, a high-end document-publishing workstation with complete tools for writing documents and creating graphics

But Sanderson predicts that in the future such documents will be produced on an Interleaf-like system on a Macintosh or an IBM PC. A version of Interleaf already runs on a Mac II; however, it is expensive

and uses 4M bytes of memory.

Pam Bliss, a Dataquest research analyst, says that as early as next year, we will start to see integrated packages on PCs that resemble high-end publishing systems such as those offered by Interleaf, Xyvision, Inc., Compugraphic Corp. and Xerox. These systems will offer text editing, graphics creation and composi-tion and pagination features in a single package, with different modules of the system running in separate windows.

Such systems presuppose the use of multitasking PCs. Bliss says IBM, Digital Equipment Corp., Hewlett-Packard Co. and Wang Laboratories, Inc. have all of-fered Pagemaker on their PCs. But she suggests that this is an interim solution.

There will always be . . .

As long as authors demand speedy, feature-filled word processors and don't want to bother with cumbersome page layout tools, there will be a demand for word processors. As long as graphic artists and designers want high-level page layout tools, there will be a need for desktop publishing software (see story above).

Noting that 80% of all end users do some type of word processing, Microsoft's Sanderson scoffs at the idea that there is one product for the whole sector

Allan Ayars, manager of desktop publishing product marketing at Xerox, sums There is plenty of room for everybody. You start to get this synergistic effect where the market grows rapidly as a result of everybody starting to set new standards and new expectations.

How will the two tools evolve? CAP International's Karsh says, "There will be long-document production kinds of tools that look like word processors but also allow end users to deal with formats - like Microsoft Word on a Mac or Microsoft Word under Windows."

Karsh predicts there will be other tools, in distributed document-production work groups, that divide the tasks. In this scenario, "authors are doing authoring, editors are doing editing, page-layout people are doing page layout," she says.

Citing the ready availability of laser writers, bit-mapped screens and graphics cards, Seybold's Marshak says she expects desktop publishing to become a niche market that will merge with typesetting, computer-aided design and manufacturing systems like Texet Corp. and Camex, Inc. at the very high end of the publishing world. •

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'ISDN provides an information outlet to every workstation, thereby eliminating time-consuming and costly wiring, as well as enhancing messaging and network control capability."

Thanks to ISDN, McDonald's will enjoy better customer service, more current market information, better tracking of product promotions, more efficient inventory control, and reduced administrative workloads.

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MANAGEMENT

TAKING CHARGE

Stanley Gibson

You better shop around



trol means that a certain vendor should be part of any equipment decision a customer makes,

and in most cases, it will be a forgone conclusion that the ven-dor will get the business." Such was the definition of account control offered by an executive for a third-party maintenance

That kind of assessment should leave MIS managers concerned with how they should react to a variety of recent moves by IBM geared toward reasserting account control.

For IBM, sales is the key to success, and account control is the key to sales. Account control is to sales what mass production is to manufacturing: It generates economies of scale that make many sales require comparatively little effort.

Looking at its recent slow years, IBM has apparently come to the conclusion that its account control has been slipping. Encroachments by DEC, plugcompatible manufacturers and third-party maintenance companies have put into doubt at some accounts the forgone conclusion that Big Blue will get

Continued on page 101

Catching new clients

Blue Cross leader diagnoses DP operation's ills

BY MICHAEL SULLIVAN-TRAINOR

When Bill Skowyra resurrected an expert system claims processing application that had been abandoned by his predecessor, the last thing on his mind was making end users more produc-

Instead, the senior vice-president of information systems at Blue Cross/Blue Shield of Missouri used the mainframe software to capture the company's first national health insurance accounts, including IBM.

"He created a position of leadership for this company," says Bob Shupe, senior vicepresident of operations for Blue Cross/Blue Shield. "We had a systems capability and the people to support it, and Bill capitalized on that."

It was six years ago that Skowyra first applied the power of his aggressive personality to a vision of a new role for information systems, propelling his company into the national health insurance spotlight.

Today, his competitive drive has led to the formation of a new corporation, a St. Louis-based spin-off of his information systems division called BPS, Inc. BPS will market third-party claims administration services to companies nationwide, providing clients with a single source of claims processing. Skowyra is a member of the company's ad-

ministrative board.
"Bill never reaches a level of

PROFILE Bill Skowyra



m: Senior vice-president of information systems. Blue Cross/Blue Shield of Missouri. Mission: Bringing his infortion systems organization out of the back office and into a position of business leadership.

complacency," Shupe continues. "He is always going on to improve on where he is or where the company is. He has a strong desire to keep a leading-edge position, and that is a burning flame inside him."

Colleagues also note, however, that Skowyra faces the challenge of communicating his vision to those outside his organ-Continued on page 99

Inside

 China faces shortage of DP pros. Page 103.

• European auditors focus on security. Page 103.

PERFORMANCE REVIEWS

Balancing controls against freedoms

BY BARBARA SEHR

eviewing employees' performance, rarely a manager's favorite task, is often particularly daunting when programmers are the subject of reviews. Managers must somehow control these creative workers while rewarding abilities that might be in scarce sup-

But the performance review can be an important tool in inspiring the loyalty of MIS employees, says Douglas H. Dolvice-president operations at United Savings Bank in Reston, Va. "You have to know what appeals to them, what motivates them,"

With creative workers, a liberal interpretation of the corporate culture often provides an incentive for productivity, Dolton adds. "Personally, I find that performance reviews in terms of things like corporate policies and punctuality are measured much more liberally for these individuals. In some cases, the ability to come to work without a tie is worth \$2,000 in annual salary to a prospective employee."

A lax view of corporate culture notwithstanding, the most

important requirement for reviewing the performance of creative employees is a set of clearly written criteria by which the employees will be judged, according to John Clarke, a senior consultant with Positive Support Review, Inc., a Los Angeles-based management consulting firm.
"Nebulous criteria are always



subject to failure," he says.

Dolton contends there are some people who simply work better without structure, while others work better in an environment in which all the rules are expressed clearly.

But Clarke says it is virtually impossible for an MIS shop to succeed with such a laissez-faire attitude. "You cannot op-erate in a vacuum," he says. "A project is usually a team effort,

Continued on page 100

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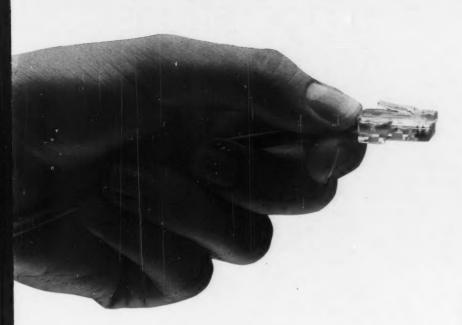
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Catching clients

ization and that his quick pace can lead to missteps and can be difficult to keep up with.

The spark that energizes Skowyra is a commitment to bringing himself and his organization out of the back office. "The day has got to come when the rest of this corporation will look to information systems for leadership," Skowyra says.

This goal corresponds to a personal desire to be recognized as a corporate executive rather than a "techie."

'When I was a systems programmer and, eventually, manager of technical support, I can remember people using the phrase 'techie,' "he says. "I'm not going to spend the rest of my life with a red T stamped on my forehead. And even though I've moved up the ladder to senior vice-president, when you put MIS, IS or EDP there as well, there is still that perception, 'Those crazy DP guys; they don't know anything.'"

From marketing to DP

Not harboring a lifelong desire to be an information systems manager, Skowyra graduated from the University of Massachusetts - Amherst in 1967 with a degree in political science. He was then recruited by insurance companies in the region for a position in marketing.

'I took a computer skills test for Aetna Life & Casualty, and I thought it would be more fun. It also paid more," he says.

After a two-year stint as a technical consultant at Aetna, Skowyra moved to Milwaukee, where he worked for four years as a systems programmer and data base administrator for Associated Hospital Service, Inc.

Fourteen years ago, he joined Blue Cross/Blue Shield of Missouri as a sys-tems programmer. Working his way through the information systems organization, Skowyra became manager of technical services, assistant director of computer services, special projects director and, finally, vice-president of MIS.

"I ended up in management. If you look at management, management is sales," he says. "You have to sell your ideas and sell your people on your ideas as well as

Relying on his marketing savvy and competitiveness, Skowyra built an information systems organization that broke the traditional mold.

"We have an account and a product fo-cus — not a functional focus," he says. "We're not trying to be the slickest producer of insurance identifications, and we don't spend much time looking at productivity issues for our end-user departments because that is a dime on the dollar.

Most of Blue Cross/Blue Shield's revenue is derived from premium dues, Skowyra says. Ninety percent of that income is used to pay claims, and of the 10% that is left over, 8% is used for operating expenses. The remaining 2% is placed in reserve or counted as profit.

"If we built computer systems that attacked that 7 or 8 cents on the dollar, we'd be crazy," he says. "What we ought to do is build computer systems that can influence that 90 cents.'

Skowyra sees the role of the traditional information systems executive as that of a scapegoat. "If he doesn't report directly to the CEO, the DP executive will be the last one in on ideas, and he won't

have ownership. So he ends up putting in chargeback systems and relying on structured methodologies and steering committee after steering committee.

At Blue Cross/Blue Shield, it is not uncommon for information systems to be in on the early discussions of business strategy. In fact, Skowyra will disagree with business plans if he deems them 'We've had new endunwise. user executives come in who were used to DP being in the back office, and it is a little adjustment for them to sit there

while the EDP executive says he's not sure he wants to go along with the plan because there's no business incentive.' Skowyra says.

Occasionally, Skowyra's attitude gets him in trouble. "Bill, in his aggressiveness, sometimes doesn't cover all his bases," Shupe says. "He leaves some bases untagged in his haste to get to that end line.

One significant mistake Skowyra has made in developing a marketing-driven information services department is to not

ANAGEMENT is sales. You have to sell your ideas and sell your people on your ideas as well as their ideas.

> **BILL SKOWYRA** BLUE CROSS/BLUE SHIELD OF MISSOURI

explain his aims sufficiently to end users.

"In the last three or four years of transition, we really didn't sell our goals enough," he says. "We did not spend enough time educating the other 1,100 people here about what we were up to. That put some distance between us and them. Now we're on a public relations campaign to address that."

Users were more concerned about Skowyra's division moving onto their turf than they were about his people failing to provide adequate support, according to some end-user executives

Some users, on the other hand, like Skowyra's expansive approach. "The performance of the information systems operation is one of the things that attracted me to the company," says Chief Financial Officer Mike Ristau, who joined Blue Cross/Blue Shield in March. "I've been places where you describe what you want and you get back excuses as to why it can't be delivered. Here, they take it and they figure out how to get it done.

As a manager, Skowyra provides inspiration and direction for his staff, while expecting results. Teamwork is important to Skowyra, according to Ed Tenholder, vice-president for national delivery systems, who has worked under Skowyra for many years. "He prides himself on building an organization that uses the ideas of his folks, but he is clearly the leader. He can be very demanding, and that's difficult at times.

Unlike some managers, who delegate responsibility and walk away from the project, Skowyra follows the work of his subordinates closely. "One of the things l admire most about him is that, with Bill, there are no excuses," Tenholder says.



Bill Skowyra leads strategic MIS efforts that help his firm attract new business.

To create his organization, Skowyra conducted a "youth movement," hiring staff members who were not prejudiced by preconceptions about the role of information services. "With a young staff, you have to listen more," he says. "With the amount of time I spend away from the floor, if I don't listen, we're not going to move on and develop our business

The challenge Skowyra faces now is to communicate his vision of the future to

"Bill has a vision for where things are going that puts him at a strategic advantage, but not everyone is going down the same road with the same level of think-Shupe says. "You have a tendency to be feet, yards and sometimes miles behind in one direction or another. Some of

that gets lost in a communication gap."

But, Shupe adds, Skowyra "sets an awesome pace that is more often found with success than with failure.

\$5,000 prize up for grabs in SIM contest

The Society for Information Management (SIM) is accepting submissions for its annual juried paper awards competition, aimed at recognizing outstanding work by senior practitioners in the field of infor-

The award for the winning paper is \$5,000, and as much as \$5,000 is to be split among runners-up. The winning submission will be published in MIS Quarterly. Other finalists will be considered for publication there as well.

Papers must describe a management information system, an approach to developing information systems or a technique for improving the management of MIS activities.

The work that is described in the paper submitted must be implemented and must also have made a significant impact on the organization. In addition, the primary author should be a manager in the organiza-

Abstracts no longer than 1,000 words must be received by SIM by Feb. 15.

All submissions should be sent to Scott Drysburgh, Deluxe Data Systems, 8901 Kilder Court, Brown Deer, Wis. N.



Balancing

FROM PAGE 95

and management must keep informed if the project is going well, if there are problems and if there need to be changes."

In setting standards with which to review the performance of programmers, some MIS managers are focusing on programmers' productivity in producing functional systems rather than on their raw output.

According to James Johnson,



Douglas Dolton

manager of corporate applications at Marine Midland Bank NA in Buffalo, N.Y., there is one key element to evaluating the performance of those who program the bank's computers. "The bottom line is the amount of function a system brings to a particular user," he says.

Performance for programmers cannot be measured in lines of code, Johnson adds. At Marine Midland, it is gauged through a function-point analysis that measures the accomplishments of an entire team against established criteria for such measures as development time, errors and ultimate functionality.

Johnson agrees with the need to provide a clear outline of the expectations for each employHE BOTTOM line is the amount of function a system brings to a particular user."

JAMES JOHNSON MARINE MIDLAND BANK NA

ee's job. He emphasizes that the function systems bring to users must be evaluated on an ongoing basis, not simply as an annual measure.

Will Creed, vice-president of information systems at Electrolux Corp. in Atlanta, agrees that time is a much more important measure of a programmer's performance than lines of code. The amount of time taken to reach an expressed objective, such as an error-free, usable program, can be a more precise measure of individual productivity, he says.

Creed points out, however, that he also puts great stock in traditions such as punctuality and adherence to corporate policy when reviewing his MIS staff. "We've been fortunate in our recruiting efforts to attract the kind of people who share our be-

liefs," Creed adds.

Tradition takes a backseat at Microsoft Corp. in Redmond, Wash., where employees with shoulder-length hair often startle visiting executives as they



Will Creed

juggle on the front lawn between moonlit creative sessions.

But results still take precedence over process in some reviews there, according to Charles Golder, who directs a

group of technical writers that produces documentation for application software. "The bottom line of all of our effort is still the corporate health," Golder says. "We're in the business of creativity for money."

He admits creativity is hard to quantify and that at Microsoft, too, a functional product is the goal. While he encourages and applauds employees willing to take risks, he must also take into account the times risks turn out to be failures. "Sometimes a dramatic change in documentation may look great to us, but the audience may look at it differently," he says.

Sehr is a free-lance writer based in Se-

Sugaring the pill: Review dos and don'ts

BY KELLY SHEA

ou don't have to hate performance reviews. With clear goals and positive questions, MIS managers can make it through employee appraisals with a minimum of pain.

The following review dos and don'ts are offered by Marilyn Moats Kennedy, managing partner of Career

Strategies, a management consulting firm in Wilmette, Ill.:

• Make it clear that it is the employee's responsibility to keep track of what he has accomplished. Then be prepared to help the employee assess those achievements. The manager should not come to the review with a list of all the failures the employee has undergone. In many cases, Kennedy says, "Self-appraisal produces more job growth and satisfaction than feedback from management."

agenteen.
• Ask pointed questions that require the employee to honestly assess his productivity and how it relates to the department's productivity. The manager should ask the employee what contribution he has made to the productivity of the department and what plans he has for increasing his productivity and continuing his education.

Be prepared to help the employee answer these questions. If he does not have a response, make suggestions that may prompt him to come up with some.

• Don't feel the need to treat a technical star differently, especially if he is negatively affecting the work of others, "A star could ac-

tually be costing you money by being territorial, especially if you start considering the percentage of salaries being wasted because of the star's adverse affect on other employees' productivity," Kennedy points out. "And when you realize that, the star begins to dim."

• Put reviews in a positive light. "When management treats reviews as the Day of Judgment, complete with thunder, suspense and black clouds, [employee] productivity tends to become very selective," Kennedy says. A doom-and-gloom attitude is bound to put added pressure on the conductor of the review as well as the subject.

Similarly, don't characterize reviews as the determining factor in whether employees are going to be kept on at a company. "Real performance appraisals should improve people's performance," Kennedy says, "not just allow them to keep their job from review to review."

Don't think that you have to make your employees like you. "As unbelievable as it may seem," Kennedy says, "you don't have to like the person you're reviewing, and they don't have to like you." Keep in mind the impression that you want the employee to come away with. "The employee's post-review thought shouldn't be, "Do I like my manager?" but "Was the review useful to me or not?"

 Make sure reviewing is an ongoing process. Provide short-term deadlines for the employee in terms of his continuing education and productivity goals, and then assist him in keeping track of his progress.

CALENDAR

JAN. 10-16

77th Annual National Retail Merchants Association Convention. New York, Jan. 10-13 — Contact: Registrar, NRMA, c/o Galaxy Conferences, Inc., P.O. Box 3918, Frederick, Md. 21701.

Informational Symposium and Exposition on Electronic Imaging Devices and Systems '88. Los Angeles, Jan. 10-15 — Contact: Society for Imaging Science and Technology, 70003 Kilworth Lane, Springfield, Va. 22151.

Neural Network Applications Conference. Los Angeles, Jan. 11-12 — Contact: Russell Webb, Institute for International Research, Inc., Suite 1212, 310 Madison Ave., New York, N.Y. 10017.

10th Annual Conference on Computer Graphics. San Diego, Jan. 13-15 --- Contact: Carol Every, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

Designing the Debit Cord Account. Miami, Jan. 13-15 — Contact: Meeting Coordinator, Electronic Funds Transfer Association, Suite 1000, 1726 M St. N.W., Washington, D.C. 20036.

Strategic Planning for New Technologies: The Role of the Planner in the 1990s. New York, Jan. 15 — Contact: Aida Rivera, Executive Programs, 1221 Avenue of the Americas, New York, N.Y. 10020.

Commtex International '88. New Orleans, Jan. 16-18 — Contact: International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

JAN. 17 - 23

Third Conference on Hypercube Concurrent Computers and Applications. Pasadena, Calif., Jan. 19-20 — Contact: Patricia McLane, Jet Propulsion Laboratory, MS 180-205. Pasadena. Calif. 91109.

1988 Optical Disk Systems Conference. Phoenix, Jan. 20-22 — Contact: Jean O'Toole, CAP International, One Snow Road, Marshfield, Mass. 02050.

Third Annual Technology in The Law Practice: The Lawyer's Personal Workstation. Dallas, Jan. 20-23. — Contact: The Conference Desk, Inc., 3701 Fairmount St., Dallas, Texas 75219.

Allitory and Space Graphics: New Applications and Future Requirements. Cape Canaveral, Fla., Jan. 21. — Contact: Tan-ya Wilson, National Computer Graphics Association, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

JAN. 21-30

Conference on Interactive Videodisk Systems. Clearwater, Fla., Jan. 24-26 — Contact: Institute for Graphic Communication, Inc., 375 Commonwealth Ave., Boston, Mass. 02115.

The Desktop Communications Conference. Anaheim, Calif., Jan. 25-27 — Contact: Infonetics, Inc., Desktop Communications Conference, Suite 100, 3235 Kifer Road, Santa Clara, Calif. 95051.

Measuring Quality and Productivity in a Data Processing Environment. Orlando, Fla., Jan. 25-27 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

Communications Networks '88. Wash-

ington, D.C., Jan. 25-28 — Contact: IDG Conference Management Group, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701

Florida instructional Computing Conference. Kissimmee, Fla., Jan. 25-28 — Contact: McRae and Co., P.O. Box 12187, Tallahassee, Fla. 32317.

Second Annual Conference on Improving Productivity in EDP System Development. Tuscon, Ariz., Jan. 25-29 — Contact: Applied Computer Research, Inc., P.O. Box 9280. Phoepix. Ariz. 85068.

DB2/SQL Users Group Meeting. New York, Jan. 26 — Contact: DB2/SQL Users Bulletin, Box 560, Wall Street Station, New York, N.Y. 10005.

Logistex 88. Anaheim, Calif. Jan. 26-28 — Contact: The Material Handling Institute, Inc., Suite 201, 8720 Red Oak Blvd., Charlotte, N.C. 28210.

American Bankers Association 1988 National Security and Risk Management Conference. Orlando, Fla., Jan. 26-29 — Contact: Ed Alwood, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

JAN. 31 - FEB. 6

Financial Investment Management Exposition & Conference. Los Angeles, Feb. 2-3 — Contact: FIM-West, P.O. Box 4440, New York, N.Y. 10163.

Society For Computer Simulation Multiconference. San Diego, Feb. 3-5 — Contact: SCS, P.O. Box 17900, San Diego, Calif. 92117.

Strategic Planning for New Technologies: The Role of the Planner in the 1990s. Chicago, Feb. 5 — Contact: Aida Rivera, Executive Programs, 1221 Avenue of the Americas, New York, N.Y. 10020.

FEB. 7-13

Building on Effective Standards Program. Orlando, Fla., Feb. 8-10 — Contact Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

international Conference on Computers and Law. Santa Monica, Calif., Feb. 8-10 — Contact: Michael Krieger, ICCL 88, P.O. Box 24619, Los Angeles, Calif. 90024.

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Continued from page 200

Focus on Operations-Villi. Profile of
the Professional. Las Vegas, Feb. 8-11 — Contact: International Association for Computer Operations Managers, 742 E. Chapman Ave., Orange, Calif. 92666.

Data Storage Interface Week. San Jose, Calif., Feb.
8-12 — Contact: Technology Forums, Suite 260, 80 W.

78th St., Chanhassen, Minn, 55317.

78th S., Channassen, munt. 39317.
CAP '88 Conference and Exhibition on Desktog and Workstotion Publishing Systems. Washington D.C., Feb. 9-11 — Contact: Computer Aided Publishing Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850. Usonix Technical Conference. Dalias, Feb. 9-12 — Contact: Usenix Conference Office, P.O. Box 385, 16951 Pacific Coast Highway, Sunset Beach, Calif. 90742.

Second Conference on Applied Natural Language Processing. Austin, Texas, Feb. 9-12 — Contact: Donald Walker, Bell Communications Research, MRE 2A379, 445 South St., Morristown, N.J. 07960.

Interex Computing Management Symposium Anaheim, Calif., Feb. 10-13 — Contact: Interex Confe ence Department, 680 Almanor Ave., Sunnyvale, Calif.

FEB. 11-20

tion & Conference. New York, Feb. 16-18 — Contact: Susan Werlinich, Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

Resocom '88, Paris, Feb. 16-19 - Contact: IDG Conference Management Group, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

FEB. 21 - 27

11th Annual Personal Computing Forum. Na Fla., Feb. 21-24 — Contact: Sylvia Franklin, Edven ngs, 375 Park Ave., New York, N.Y. 10152.

The Fifth Annual Electronic Printing Systems Conference. San Jose, Calif., Feb. 21-25 — Contact: S. Thomas Dunn, EPS '88 Conference Chairman, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

Effective Methods for Data Processing Quality Assurance. Orlando, Fla., Feb. 22-24 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla.

Fourth Annual Computer Graphics New York. New York. Feb. 22-24 — Contact: David J. Small. Exhibition Marketing & Management Co., Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Vision Guidence For Robotic Systems. Cincinnati, Feb. 23-25 — Contact: Joanne Rogers, Special Programs, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Interactive Instruction Delivery/Learning Technology in the Health Care Sciences. Kissimee, Fla. Feb. 24-26 --- Contact: Society for Applied Learning Tech e. Fla.. nology, 50 Culpeper St., Warrenton, Va. 22186

Strategic Planning for New Technologies: The Role of the Planner in the 1990s. Atlanta, Feb. 26 — Contact: Aida Rivera, Executive Programs, 1221 Avenue of the Americas, New York, N.Y. 10020.

TEB. 28 - MARCH 5

once. Bal Harbour, Fla., Feb. 28-March 2 - Contact: Ed od, American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Third international Conference on CD ROM. Seat-tle, March 1-3 — Contact: Sherrie Eastman, Microsoft Corp., Box 97017, 16011 N.E. 36th Way, Redmond, Wash.

Dexpo Europe 88. London, March 1-3 — Contact: Expoconsul International, Inc., 3 Independence Way, Princepoconsul Internation, N.J. 08540.

MARCH 6 - 12

2nd IEEE Confe Santa Clara, Calif., March 7-10 — Contact: Computer Society of the IEEE, 1730 Massachusetts Ave. N.W., Washing-

Federal Office Systems Expe (FOSE) '88. Washing-ton, D.C., March 7-10 — Contact: Debbie Murray, Nation-al Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

1988 Spring National Design Engineering Show and Conference. Chicago, March 7-10 — Contact: SNDES, 999 Summer St., Stamford, Conn. 06905.

Gibson

CONTINUED FROM PAGE 95

the business. Among IBM's moves to revitalize account control is an effort to assure that it is the primary maintenance provider in a shop. This is in accord with the belief that he who controls maintenance controls the hardware in a shop.

IBM's Corporate Service Amendment discount program and its recent deinstallation and reinstallation price reductions show that IBM wants this role. It wants to gain market share in maintenance rather than just earn more maintenance dollars.

In addition, IBM has acknowledged it is carrying out a pilot program in which it acts as a single point of contact for all data center maintenance, including maintenance done by non-IBM providers

In addition, the creation of IBM's Applications Systems Division is an attempt

HILE one-stop shopping may be good at suburban shopping malls, is it good for the MIS shop?

to offer a single point of contact for application software needs, whether or not it wrote the software it sells to the customer. IBM uses the phrase "one-stop shop-

While one-stop shopping may be good at suburban shopping malls, is it good for the MIS shop? On the one hand, it offers convenience and allows a buyer to spend less time shopping and more time on other things. A buyer can hope to benefit from Volume Procurement Amendment discounts as well. There will no doubt be some shops for which such an arrangement works hest.

On the other hand, stopping at only one store is a lazy way to buy anything. When the stakes are as high as they are in computing - keeping costs down and giving a company a strategic competitive edge - lazy shopping habits are likely to be out of place.

Besides, MIS managers are paid to get the best deal possible for their company. They are paid to shop around, not just to fill out an order form.

IBM's efforts to offer everything under one roof can bring more choice, espe cially in the short run, providing the user does price and compare some of IBM's new offerings with others on the market. But users will have to actually buy a fair percentage of non-IBM gear in order to preserve choice and keep all vendors' prices competitive.

According to several customers, recent IBM hardware deals have been particularly attractive when competition has been involved. This proves the wisdom of getting competing bids and considering them seriously.

Keeping a variety of vendors around, despite any inconvenience, is an investment in the future. It provides leverage and ensures that when IBM offers a price on competing equipment, it will be a fair price. Some MIS managers know this and do this. This is how they control their accounts.

Gibson is a Computerworld senior writer.

OCAL HAPPENINGS

NORTHEAST

ing Ma ort, N.Y., Jon. 12. Data Proce ment Association (DPMA), Suffolk County Chapter. Local Area Networks, with The Computer Station. Windjammer Restaurant, Rt. 25A. 6 p.m. Contact: Monika Mac Lean, Suffolk County DPMA, 257 Depot Road, Huntingto

New York, Jun. 13. Association for Women in Comput-ing, New York Chapter. Documentation for Hardware and Software panel discussion. Manufacturers Hanover Trust, 270 Park Ave. 5:30 p.m. Contact: AWC, P.O. Box 2293, Grand Central Station, New York, N.Y. 10163.

Henrisburg, Pa., Jan. 13. Association for Systems Management (ASM), Central Pennsylvania Chapter. Local Area Networks, with Thomas Slick of Tasco, Inc. O'Hara's staurant. 5:30 p.m. Contact: Mark Anderson, 809 Acri Road, Mechanicsburg, Pa. 17055.

on, Jan. 15. Society for Management of Profes ment Directions in Distributed al Computing. Digital Equipment Directions in Distributed Computing. Anthony's Pier 4. 11:45 a.m. Contact: SMPC, 715 Boylston St., Boston, Mass. 02116.

ent Association (DPMA), Maine Pine Tree Chapter. Leadership Qualities, with former Gov. Ken Curtis. The Bangor Hilton. 5 p.m. Contact: J. Fieweger, Delta Chemicals, Inc., Searsport, Maine 04974.

Boston Chapter. What Can We Learn from European MIS? with John Thompson of Index Group. Anthony's Pier 4. 11:40 a.m. Contact: SIM, P.O. Box 116, Newton Lower Falls, Mass, 02162.

SOUTHEAST

amblan, Go., Jan. 12, ASM, Atlanta Chapter, Data Planning Concepts, with Barbara Helmer of Data Architects. Holiday Inn Chamblee-Dunwoody, 4386 Chamblee-Dunwoody Road. 5:30 p.m. Contact: Jane Roberts, HBO &

Co. Suite 1000 1 Ravinia Drive Atlanta Ga 30346

wiotte, N.C., Jan. 21. ASM, Queen City Chapt Managing for the Future, with Robert E. Roberson of University of South Carolina. Cosmos Steak House, 5100 E. Independence Blvd. 6 p.m. Contact: Robert Yearwood, Metro Information Services, Suite 140, 7 Parkway Plaza, Charlotte, N.C. 28217.

Lafayette, La., Jan. 21. DPMA, Acadiana Chapter. Monthly meeting. Evangeline Steak House, Highway 167 S. 6:30 p.m. Contact: Debra Billeaud, Guaranty Bank and Trust Co., 4th Floor, 200 W. Congress, Lafayette, La.

MIDWEST

Tulso, Oklo., Jon. 6. ASM, Tulsa Chapter, The Critical Role of Teamwork in Data Processing, with Roy Dickson. 5:00 p.m. Sheraton Inn Airport, 2201 N. 77th East Ave. Contact: Naston Manley, ASM, P.O. Box 2926, Tulsa, Okia,

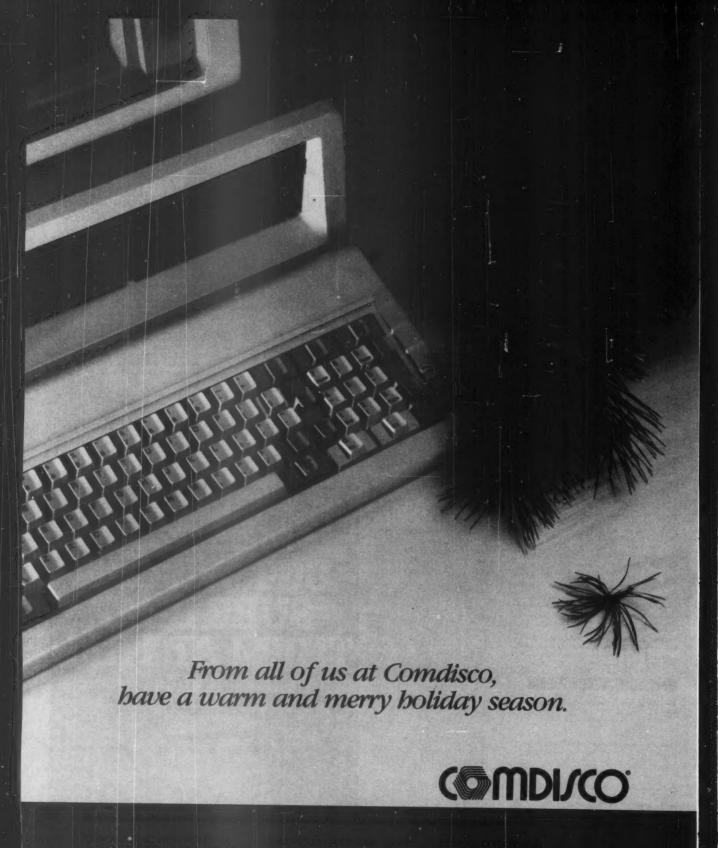
Indianopolia, Jem. 7. ASM, Indiana Chapter. State Base Planning — Enterprise Modeling, with Jeff Hoffer of Indiana University. Holiday Inn Southeast, Interolis, Jon. 7. ASM, Indiana Chapter. Strategi state 465 and Emerson Ave. 6 p.m. Contact: Lloyd Louks, ASM, Bank One Indiana, 450 E. Washington St., Indianapolis. Ind. 46277

Das Moines, Iowa, Jan. 11. ASM, Des Moines Chapter. Assertive/Aggressive/Passive Communication, with Kay Prihoda of Growth Systems. Howard Johnson Inn, Merle Hav Road, 5 p.m. Contact: Joleen Montag, Integrated Resources Life Insurance Co., 3737 Westown Pkwy. West Des Moines, Iowa 50265.

ania, Ohio, Jan. 13. ASM, Toledo Chapter. Artificial Intelligence, with Richard Aeh of AT&T. The Some place Elae. 5:30 p.m. Contact: Dale R. Briggs, Systems Division, Marathon Oil Co., 539 S. Main St., Findlay, Ohio

Continued on page 103





Continued from page 101

Kulumaxoo, Mich., Jan. 13. DPMA, Southwestern Michigan Chapter. Monthly meeting. Contact: William J. Habelen, The Upjohn Co., 7171 Portage Road, Kalamasoo, Mich. 49001.

Fort Wayne, Ind., Jan. 19. ASM, Fort Wayne Chapter. Critical Success Factors for I/S, with Alan Stanford of Ernst & Whimney, Holiday Inn-Downtown, 300 E. Washington Blvd. Contact: Beth Hukill, Suite 103, 10427 Leo Road, Fort Wayne, Ind. 46825.

Hinadole, Ill., Jun. 19. ASM, Oakbrook, O'Hare and Chicago chapters. Computer Crime, with U.S. Attorney Anton Valukis. Cypress Restaurant, 500 E. Ogden Ave. 6 p.m. Contact: David P. Miller, 508 W. Glencoe Road, Palatine, Ill. 60067.

Dwyton, Ohio, Jon. 19. ASM, Megacity Chapter. Monthly meeting. Officers Club, Wright-Patterson Air Force Base. 5:30 p.m. Contact: S. Beebe-Owen, Western Ohio Pizza, Inc., 2324 Stanley Ave., Dayton, Ohio 45404.

Columbus, Ohio, Jan. 27. ASM, Central Ohio Chapter. Children's Hospital's Use of Computers, with Malcolm Murray of Childern's Hospital; Systems Application Architecture, with Dick O'Connor of IBM. Pawcett Center for Tomorrow, 2400 Olentangy River Road. 5 p.m. Contact: Deborah Maccora, Columbus Southern Power Co., 215 N. Front St., Columbus, Ohio 43220.

WEST

El Paso, Texas, Dec. 22. DPMA, El Paso Chapter. Awards and new officer installation. Great American Land & Cattle. 5:30 p.m. Contact: Steve Tarro, P.O. Box FNB, Las Cruces, N.M. 88004.

San Francisco, Jun. 21. Association for Computing Machinery, Golden Gate Chapter. The Changing Role of Supercomputers, with Bence Gerber. Seven Hills, 252 California. 5:30 p.m. Contact: James M. Spitzer, The Systems Consulting Consortium, Inc., P.O. Box 2331, Stanford, Calif. 94305.

Walnut Creek, Calif., Jan. 20. ASM, East Bay Chapter. Monthly dinner meeting. Contact: ASM, 32 Robert Road, Orinda, Calif. 94563.

Santa Monica, Collf., Jan. 23. DFMA, Los Angeles Chapter. 1988 Installation Dinner Dance. The Chronicle Restaurant, 2640 Main St. 6 p.m. Contact: DFMA, P.O. Box 1047, Hollywood, Calif. 90078.

CANADA

Ottowo, Jan. 12. ASM, Ottawa Valley Chapter. Mainframe Financial Systems — Lessons of an Ottawa Project. Ottawa Board of Trade, 185 Sparks St. Contact: Arnold Finkelstein, Bank of Canada.

Kitchener, Ont., Jan. 18. ASM, Conestoga Chapter. I.S. Productivity, with Bruce Burgetz of Gellmon-Hayward & & Partners. Conestoga Inn. 6 p.m. Contact: Rich Clemmer, 49 Industrial Drive, Elmira, Ontario, Canada. N3B 381.

High-tech work not seen as burnout threat

WILLOW GROVE, Pa. — Burnout is common among business managers and appears to arise more frequently among women than men, according to a recent study conducted by the Administrative Management Society (AMS).

But working with computers does not pose a significant threat of burnout. In a list compiled from survey responses, the AMS found that of the most common sources of stress, working with computers is last, along with travel and working

with budgets.

In a survey of 344 managers from companies of various sizes around the U.S., 57% said burnout is common among managers. Of those reporting burnout, 55%

were women.

Just under two-thirds of the managers responding — 65% — said their jobs are more stressful than average.

China in DP worker pinch

Faces shortage of half-million computer specialists by 2000

HONG KONG — The People's Republic of China may face a shortfall of 500,000 computer specialists by the year 2000,

according to a recent newsletter report.

Approximately one million people have undergone some sort of information technology training in China, but specialized skills are in short supply, according to Chinese experts quoted in "China Informatics," a newsletter published by market research firm International Data Corp. China Ltd.

China will need 720,000 information technology specialists by 1990, and 1.93 million by the end of the century, according to the report in the newsletter, which was formerly named "EDP China Re-

The shortfall is expected to total between 20,000 and 30,000 by 1990, growing to 500,000 by the end of the century.

State Council officials Guo Rungkun and Lu Jianzhong reported that while electronic data processing training in China began in the mid-1960s, most of today's users learned their craft during the country's sixth five-year plan, which ended in 1985.

After 1985, China was able to call upon some 32,000 people with specialized skills in disciplines such as data and satelite communications. By then, at least 812 organizations had begun to offer informa-

tion technology training. But demand for fully trained staff is said to be outstripping

The two officials said that China has tackled information technology education on four fronts — through correspondence courses, short-term full-time education, on-the-job training and retraining.

The changing nature of technology has

OURCES SAID part of the shortfall could be blamed on the repression of so-called intellectuals during the 1960s. One referred to the period as a "generation of lost skills."

added to China's problem, but a partial solution has been found in continuing education through the country's Television University. Television University functions similarly to the UK's Open University, which offers broadcast lectures and correspondence courses to full-time workers.

China's sixth five-year plan provided

100,000 people with some form of information technology training through Television University.

vision University.

Between 15,000 and 20,000 Chinese engineers also attended information technology courses lasting from three to six months at educational institutions in China during the same period.

Courses organized by work units were attended by 36,000 people — roughly 1.75% of the working population in China during that period. At Beijing's Capital Iron and Steel Co., 10% of the work force was given information technology training, the report said.

Retraining poses the biggest problem for China. A large group of older technicians, many of whom were USSR-trained, have skills that are increasingly out of date, and many of them need foreign language training, according to the officials.

Though no comment was made on the depredations of China's cultural revolution, other sources said that part of the shortfall could be blamed on the repression of so-called intellectuals during the 1960s. One referred to the period as a "generation of lost skills."

With the recent shift in politics in China, more students are emerging with information technology skills. About 60% of China's universities, colleges and vocational training schools offer information technology-related studies.

At the junior-school level, however, the country is able to do very little. The number of primary schools is so large that equipping them adequately remains impossible.

Europe's auditors key into security

AMSTERDAM — Security issues, including the need for coordinated European actions, stole the limelight at a conference here last month attended by nearly 500 data processing auditors.

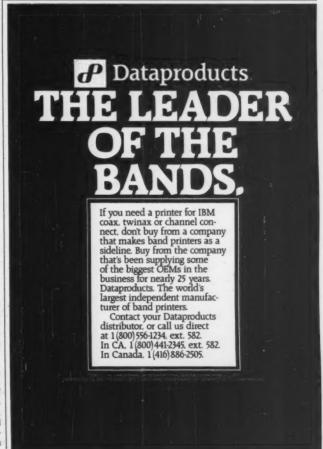
John A. Minta, president of the Electronic Data Processing Auditors Association (EDPAA), said one of the main tasks of an EDP auditor is to advise management about problems such as the security of internal data flow.

The gathering — the Second European Conference on Computer Audit, Control and Security — was organized by the EDPAA and the Dutch computer association. NGI.

In his closing speech, Louis Bril, Belgium's secretary of state for science policy and public service, called for common data security measures among European governments.

It is important to develop "common approaches for penal law and for procedural law in order to protect international data networks, to enable the functioning of international instruments of cooperation in criminal matters and to guarantee that evidence gathered in one country is admissible in court in another country," Bril said.

"What is needed is not a mechanistic reaction to the requirements of some law, but rather a full appreciation of the role of and need for data protection in an organized working environment," Bril said. Minta, EDP auditor at Liberty National Bank & Trust Co. of Louisville in Kentucky, said auditors face a challenge in keeping abreast of technological change.



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COMPUTER INDUSTRY

INDUSTRY INSIGHT James A. Martin

Taiwan first on the block?



Speculation is growing that the first steps into the uncertain waters of the soon-to-materialize IBM Per-

sonal System/2-compatible industry will be taken by Taiwanese companies, not American ones.

At Comdex/Fall '87, for example, Mitac International reportedly previewed a PS/2 Model 30 clone. The machine is supposed to be available early next year for less than \$1,000, compared with IBM's \$1,695 st price for the Model 30. The Mitac version is said to be based on a chip set from Chips and Technologies and a BIOS system from Phoenix Technol-

In addition, unconfirmed reports strongly suggest that Multitech Electronics in Taiwan and, possibly, its San Jose, Calif., affiliate, Acer Technology — is preparing to introduce a Model 30 compatible this spring and. perhaps, a PS/2 Model 50 Micro Channel clone as well.

Although Multitech has downplayed the reports, just about everyone is saying that a Model 50 look-alike is possible in time for Comdex/Spring '88 and that Multitech, or perhaps another aggressive offshore company, will be the one to introduce it.

Ripe for the picking

While compatible vendors in the U.S. struggle with cold feet, there's a brand new market ripe for the picking, and many Asian companies are just brazen enough to take the chance. After all, they have the most to gain and the least to lose.

Asian micro vendors had their first opportunity for the American market when Chips and Technologies started making low-cost Personal Comput-er AT chip sets. But the PC ATcompatible market soon became flooded with more "me too" products than anyone would care to count.

This time around, however, the situation is quite different. There is a potentially lucrative PS/2-compatible industry just

Continued on page 114

Memorex bids to buy out Telex

Company welcomes 'white knight' offer after Edelman's hostile attempts

BY CLINTON WILDER

TULSA, Okla. - Taking the first step toward a major consolidation in the IBM-compatible terminals industry, Memorex International N.V. last week launched a friendly acquisition bid for hostile takeover target Telex Corp.

Telex, which has been trying for weeks to fend off corporate raider Asher B. Edelman, welcomed the Memorex bid, which is roughly \$7 per share higher than Edelman's recently lowered offer. But Edelman intends to continue his effort and said in a strongly worded letter to Telex that he may consider raising his

The offer from London-based Memorex amounts to an estimated \$911.4 million in cash and stock, compared with Edelman's

cash offer of \$808.5 million. Even with a higher bid from Edelman, the fact that Telex management welcomes the "white knight" offer gives Memorex a good chance to succeed in the acquisition, analysts said.

Makes sense

'Assuming Memorex can raise the money, the thing makes a lot of sense strategically," said Michael Geran of E. F. Hutton & Co. "There are natural economies of scale here, and Memorex is stronger overseas, while Telex has strength in the U.S."

If Memorex is successful, the merger will dramatically increase its share of the IBM 3270 terminal market, in which Telex trails only IBM itself (see chart below). Ironically, Memorex was rumored to be considering withdrawal from that business before Unisys Corp. sold most of Memorey to Memorey's international management group last year [CW, Nov. 10, 1986].

Enlarge IBM business

A merger would also combine the two firms' IBM System/36 and 38 terminals businesses, a market Telex entered in late 1986. In 1986, Memorex was third in U.S. shipments of those terminals with 5% of the market. according to Framingham, Mass.-based market research firm International Data Corp. (IDC). IBM controlled 73% of the market, and Decision Industries Corp., another current hostile takeover target (see story below), held 17%.

"The whole synergy would be very good for Telex in that mar-ket," IDC senior analyst Filess ket," IDC senior analyst Eileen O'Brien said. "The 3270 market

Continued on page 107

Supplier woes hit Micropro

Documentation delay causes late shipments

BY STEPHEN JONES

SAN RAFAEL, Calif. - Delays in product shipments have sidetracked Micropro International Corp.'s bid to regain some of its lost glory as the former king of word processing software, the company said last week.

Micropro said that shipments of its Wordstar 2000 Release 3 were delayed because the vendor received late delivery of documentation and other printed materials from its supplier, Chicago-based R. R. Donnelley & Sons Co.

Without the printed materials and packaging for Wordstar 2000, Micropro was left with disks that could not be delivered, said Leon Williams, president and chief executive officer of Mi-

Officials at R. R. Donnelley would not comment on the late shipments.

Sales figures hurt

Although the Wordstar 2000 copies have since shipped, Williams said that about \$700,000 will be conspicuously absent Continued on page 106

Inside

 Western Digital acquires Tandon's Winchester busi-

ness. Page 106.

• Texas Instruments chairman retires. Page 106.

Onset raises The urge to merge 1986 IBM 3270 terminal U.S. market shares ante in bid

PERCENT MARKET SHARE Memorex 5.2% Other 5.8% Lee Data 4.3% Couries Information Systems

MATION PROVIDED BY INTERNATIONAL DATA CORP. CW CHART

BY ALAN ALPER

NEW YORK - Onset Corp., the shell company formed by venture capitalists to acquire Decision Industries Corp., last week raised its friendly tender offer above a competing hostile bid from Econocom International

Onset increased its offer by Continued on page 107

ADR's Bennett heads for greener pastures

BY ALAN ALPER

PRINCETON, N.J. - There comes a time when all top executives contemplate the greener pastures of retirement. For John Bennett, who at the end of this month will cap a 21-year career with Applied Data Research, Inc. (ADR), retirement means sampling the putting greens of the world's greatest golf courses.

'At my age, it will be a challenge keeping my handicap at quips the spunky 65-yearold ADR chairman. "In all candor, though, I'll probably get it down to 10, but that's based on who I play with."

While golf will take precedence over most matters, BenADR, the \$170 million mainframe data base management systems developer and subsidiary of Ameritech. Under an dpen-end consulting contract, he will make occasional sales calls to key accounts and presentations at conferences and seminars, while splitting time between his homes in Stuart, Fla., and Skillman, N.I.

In preparation for his departure, Bennett passed the chief executive's baton in September to President Dennis Strigl, who joined ADR a year earlier from a sister Ameritech company. Although Ameritech policy calls for executives to retire at 65. Bennett says he was not asked to step aside.



John Bennett

"I have an earnest desire to enjoy the rest of my life," he "Retirement looks just fine savs.

Bennett, who spent 17 years as ADR's chief executive, is departing two years after negotiating its \$215 million acquisition by Ameritech. The acquisition, which came after a six-month period of receding revenue growth and declining profitability, followed a 10-year span of revenue increases that averaged 30% annually for ADR.

"[John] knew when to exercise power, and he knew when to give it up," says Bernard Goldstein, a partner with software industry investment banking firm Broadview Associates in Fort Lee, N.J. "It's something that is not easy for a CEO."

During 1985 and 1986, growth at ADR and other DBMS vendors was stunted by the spreading influence of IBM's new relational DBMS, DB2. The

Continued on page 114

Western Digital purchases Tandon Winchester drive unit

"This certainly gives them a

jump start in a very high-growth

area. As for Tandon, they will

have to make it in systems or not

at all." he added.

CHATSWORTH, Calif. — Tandon Corp., the world's secondlargest independent hard disk drive maker, last week announced the sale of its Winchester disk drive business to Western Digital Corp. for between \$40 million and \$45 million in cash.

In addition to the sale price, Irvine, Calif.-based Western Digital will absorb about \$35 million in debts associated with the business, according to James Porter, president of Disk/Trend, a Mountain View, Calif., research and consulting firm.

Twelve-year-old Tandon will focus its efforts on the IBM-compatible microcomputer business that it entered in 1986.

Trails only Miniscribe

Tandon trails only Miniscribe Corp. in the independent 20Mbyte, 3½-in. hard disk drive business, according to Porter. "Western Digital has been

"Western Digital has been looking for ways to get into disk drives for a number of years,"

Micropro

from Micropro's first quarter

sales totals because of the delays. The company's first fiscal quarter ended Nov. 30.

That leaves Micropro hoping

that it can at least break even on its earnings, which are expected to be released by the end of this week.

For the same quarter last year, Micropro reported revenue of \$8.4 million and barely broke even, with earnings of \$26,000, yielding no per-share earnings.

Micropro has been slowly climbing out of the red during the last year, updating old programs to win back its vast installed base while aiming new products at specific vertical markets.

Road to recovery

Williams conceded that the shipment problems could check Micropro's apparent rebound, but he claimed the company is still on the road to recovery.

"In reality, the delays had nothing to do with the basic financial health of the company. It was a delivery problem, not a financial one," Williams explained.

Micropro said it has sold as many as 25,000 copies of Wordstar 2000 Release 3 since it was launched in late October.

The word processing package is available in two versions, one tailored to the legal community and the other designed for general-business use.

TI Chairman Shepherd steps down

DALLAS — Texas Instruments, Inc. Chairman Mark Shepherd Jr. has announced his retirement and will pass his title to President and Chief Executive Officer Jerry R. Junkins.

Shepherd, 64, will leave TI on April 21 after 39 years with the company. Elected chairman in 1976, Shepherd will remain on the board of directors.

Shepherd joined the company in 1948 as a project engineer. He later became TI's chief semiconductor designer and was named general manager of the Semiconductor Components Division in 1954. He became a vice-presi-

dent the following year.

Shepherd became a TI executive vice-president and chief operating officer in 1961. He was named president in 1967, CEO in 1969 and chairman in 1976. He relinquished the roles of president and CEO to Junkins in 1985.

It's one thing to fill a document with data, another to fill it with content that makes someone take action. The document that best persuades not only has a typeset appearance, with visual as well as typographic elements, but also has superior content—facts and figures drawn from all possible sources to make a point of view, a point of sale.

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Xerox Document Systems create proposals that will be tossed around



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Onset

FROM PAGE 105

75 cents per share to \$9.50 a share. J. H. Whitney & Co. and Welsh, Carson, Anderson & Stowe, the New York investment firms that are behind Onset, declined to say why they upped the offer for all 9.4 million of Decision Industries' outstanding shares.

"One can draw his own conclusion," said William Hewitt, an attorney representing the investment group. Onset's offer expires Dec. 29.

Onset increased its offer Tuesday, two days before a competing \$8.75 offer made by Econocom was to expire. The timing was important, some said, since most shareholders tender their shares just prior to an offer's expiration date. The sweetened offer was expected to give shareholders, mainly institutions, an incentive to tender their shares to Onset rather than take Econocom's offer.

Econocom had said it would be willing to increase its \$8.75 offer if financial information provided by Decision Industries merited such action. A spokeswoman for the Amsterdambased international leasing firm declined comment at press time. Econocom owns approximately 23% of Decision Industries' outstanding shares.

As part of the amended offer. fees payable to Onset would be increased by \$2 million to \$5.5 million in the event the deal to acquire Decision Industries is not concluded and another concern, such as Econocom, purchases the Horsham, Pa., firm. "This protects [Onset's] interest and compensates them as the White Knight' who helped raise the price paid to shareholders," explained Joel Sussman, Decision Industries' treasurer.

Decision Industries' board has recommended that shareholders accept Onset's offer. The offer is contingent on receiving a majority of Decision Industries' shares and Onset's ability to obtain a three-year, \$50 million revolving credit line.

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COMPUTERWORLD

Memorex

FROM PAGE 105

is an extremely mature one for terminals, and Telex needed to get into other areas, but they're definitely having problems in the System/3X market at this point."

Approximately 74% of Telex's outstanding shares had been tendered to TLX Acquisition Corp., the corporate entity formed by Edelman to manage the takeover, as of Nov. 24. But Telex stockholders can withdraw those shares and tender them to Memorex.

Edelman's demands

Late last week, Telex agreed to provide Edelman with the financial information that has been made available to Memorex.

Edelman also demanded in a letter to the company's board of directors that Telex "advise us of any other steps you have taken or expect to take to facilitate the Memorex proposal, so that we have a basis upon which to consider improving upon our offer."

Last month, Edelman lowered his bid by \$10 per share to \$55 [CW, Dec. 7]. The Memorex proposal offers shareholders \$56 per share in cash and \$6 per share in the junior preferred class of Memorex stock.

A Memorex-Telex combination would be a logical evolution within the terminals industry, which has been battered by price cuts and falling demand since the proliferation of personal computers.

"Even without Edelman. there would have been consolidation in this business anyway," Hutton's Geran said. "The profit got squeezed out of it."

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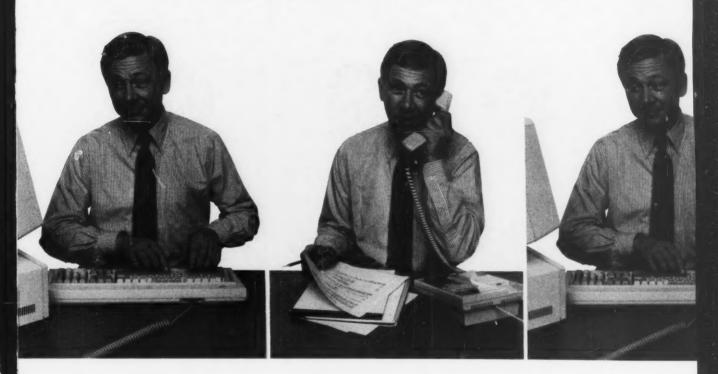
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"We advertised in Computerworld, Computerworld's SPOTLIGHT section and Computerworld card decks. And the results from all three were excellent."

Mark Potenzone
Westinghouse Management
Systems Software



Mark Potenzone is National Sales Manager for Westinghouse Management Systems Software. This group within Westinghouse markets IBM mainframe productivity enhancement software and operating systems software.

Westinghouse has taken advantage of three advertising opportunities that *Computerworld* offers, much to Mark's — and the company's — satisfaction.

"We've done mostly image advertising in order to create awareness of this group. The name 'Westinghouse' is certainly recognizable, but not as a major software supplier, even though we've been in the software business for nearly 20 years.

"We chose Computerworld partly because of personal experience. As a software professional, I've



read it for as many years as I've been in the business, and so has everyone I've worked with. In fact, I can't imagine a computer professional NOT reading Computerworld.

"We advertised in Computerworld, Computerworld's SPOTLIGHT section and Computerworld's Card Decks. And the results from all three were excellent. We've seen what advertising in Computerworld can do, so there was no surprise there. SPOTLIGHT also delivered very pleasing results. Because it is a special pull-out section devoted to one subject, it makes sense that when we advertised in their Network Software issue, we were reaching our customers and polential customers — exclusively.

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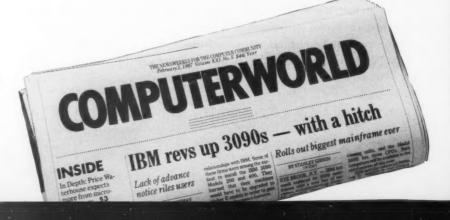
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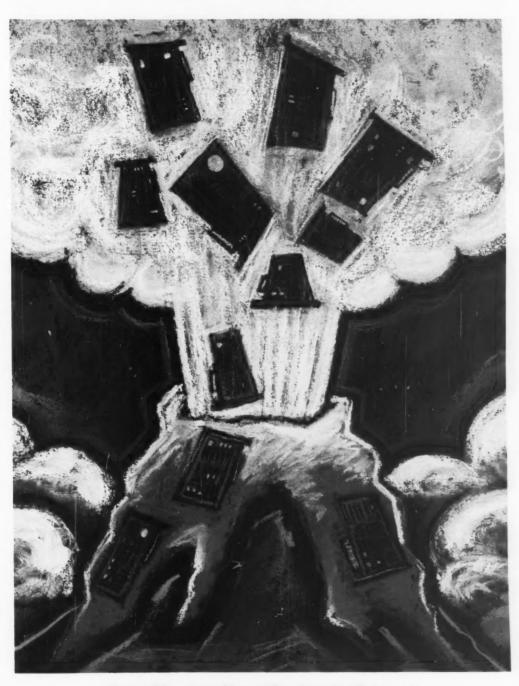
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Datagram Corporation of East Greenwich, Rhode Island manufactures and markets STEAMER, a data compressor that allows user organizations to cut their number of communications lines by up to 67 percent. And at least one customer was able to eliminate an entire data center and save \$2.5 million a vear

But since true data compressors and their very real benefits - are not that well known by the user community, Datagram needed to increase awareness of this technology and STEAMER in particular. notes Tom McGovern, Vice President/Sales and Marketing for Datagram.

"Going in, we recognized that we were faced with making a conceptual sale. We knew we'd have to make people aware of the con-

cept of data compression before they'd buy. So our goal was to educate potential users and generate inquiries

"We chose Computerworld, quite simply, because my many years of experience with it have shown me what a very effective vehicle it is. For example, we're trying to reach MIS and data communications professionals. And Computerworld effectively delivers both. In fact, of the total number of responses generated by Computerworld, 40 percent come from companies that have datacomm managers. Computerworld is a communications book as well as an MIS book.

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INSIDE In Depth: Price Wa-

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INSIDE



Adjusting the Focus

IBM's introduction of the PS/2 with its VGA standard is forcing manufacturers of add-in graphics boards to reevaluate strategies. Page S6.

Vendor Viewpoint

VGA-compatible graphics boards offer MIS managers the opportunity to keep up with the state of the art while still preserving their investment in existing hardware. Page S6.

Desktop Communications

PC facsimile boards combine a direct link with the outside world with the means for preserving and organizing message traffic. Page S7.

Product Charts

A selected listing of memory expansion boards for microcomputers. Page S7

A detailed guide to accelerator boards. Page S9.

SENIOR EDITOR Joanne Kelleher

ASSOCIATE EDITOR
Deborah Fickling

DESIGN EDITOR Marjorie Magowan

RESEARCHER Sally Cusack

ASSISTANT RESEARCHER Bonnie MacKeil

Cover illustration: Paul Schulenberg

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Some people are staving off the future with add-in boards that make the most of what they already own

USERS GUARD THEIR OPTIONS

BY MICHAEL SULLIVAN-TRAINOR



TED PITTS

erospace contractor Sundstrand Aviation is purchasing compatibles for the first time, ending six years of loyalty to IBM, because the add-in boards the company needs are not yet available for the Personal System/2. "Ever since the first personal computer, we were determined to go IBM all the way," says Jim Wilt, office systems analyst for the Rockford, Ill.-based division of Sundstrand Corp. "But we put the PS/2 on hold because we're not ready for it and the expansion boards aren't there."

The availability of add-in boards has always been an important factor in buying decisions. But the current explosion of new types of boards for existing machines — ranging from Intel Corp. 80386-based accelerators to local-area network connections — is making them an even more vital part of PC purchases, especially in view of market uncertainty about the flood of board products expected for the PS/2.

Although custom chips on IBM's PS/2 are performing some traditional board functions, users will require another generation of add-in boards to take full advantage of new bus architectures and future versions of IBM's and Microsoft Corp.'s OS/2 operating system.

But microcomputer managers are reacting cautiously to the developing onslaught of boards and functions that could dramatically change the nature of their PCs. For most, the issues of compatibility with installed systems and the level of end-user sophistication are more important than acquiring the latest technology.

"Many of the systems that are out don't have software applications designed to use the functionality they provide," says Jocelyn Young, a market analyst for Future Computing, Inc. in Dalas. "If you can get something to lengthen the lifespan of your existing product until there are

applications for the new systems, that may be the wisest choice."

Micro managers' interest in enhancing old products while moving very slowly toward new ones is reflected in market predictions for add-in board purchase. The need for translator, accelerator and memory boards will continue to drive add-in board sales through this year and the next. Future Computing predicts that one million more boards (ones not bundled in the original system) will be sold in 1988 than in '87.

After 1988, board demand will be limited until software applications and intelligent coprocessor boards become available for the new bus architectures. In addition, because many IBM Personal Computer users will move to the PS/2, the functions provided by traditional multifunction boards will no longer be needed. Future Computing forecasts a decline in board purchases: Only 7.1 million boards will be bought in 1989; 7.2 million in 1990.

These trends are evident in the current plans of corporate users. At the Farm Bureau Insurance Group in Lansing, Mich., end users primarily employ traditional word processing and spreadsheet applications on nearly 200 assorted IBM PCs, PC XTs and ATs. Multifunction boards provide additional memory, ports, clocks and calendars for the systems, and IBM 3270 terminal emulation boards provide access to the

Sullivan-Trainor is a senior writer for Computerworld.

Options

FROM PREVIOUS PAGE

company's host systems.

The Farm Bureau is limiting add-in board acquisitions to create a standard set of easily maintained products, according to data center director Art Kelley. This careful board acquisition policy extends to 40 PS/2 Model 30s and two Model 50s that the company recently acquired.

Because the new systems include functions previously provided by multifunction boards, those boards are no longer necessary. The insurance group will install only emulation boards on the PS/2s. "We didn't have to reevaluate our board set for the Model 30s," Kelley says. "We view them as enhanced replacements for the PCs and XTs. They're a little faster, but we don't have any illusions that they will run OS/2."

With the exception of a small percentage of power users who will use the Model 50s, the company says it does not foresee an immediate need for OS/2 or the advanced boards that will drive OS/2 applications.

E. F. Hutton & Co. in New York is taking a similarly conservative stance on board acquisitions. With 10,000 NCR Corp. 3390 AT-compatible workstations slated for installation in mid-1988, the firm is settling on a standard set of boards to meet application needs. New board developments are not part of E. F. Hutton's immediate future.

"Each time there is new technology, you look at it. But the bottom line is that what we have is working well within the constraints," says Milton Milamed, vice-president of distributed systems.

Boards that are a priority in E. F. Hutton's plans are Starlan boards from Data General Corp. that connect PCs to a network of larger DG systems, memory boards used to enhance the capabilities of 800 NCR 810 workstations that receive stock market prices via satellite and synchronous communications boards from IBM.

Fast boards, slow systems While IBM claims to have shipped more than one million PS/2s, the size of the installed base of its previous generation of PCs and compatibles far exceeds the number of new systems. Board suppliers are aiming a host of products at upgrading and enhancing an estimated 16 million IBM PCs and compatibles, according to Don Williams, senior vice-president of the Enhancement Products Group at AST Research, Inc. in Irvine, Calif.

OS/2 is one of the prime factors driving the need to upgrade existing systems. For example, an XT or compatible system can run OS/2 with the addition of an Intel 80286-based add-in board and memory enhancements, Williams says.

"Large numbers of people will run OS/2 on other hardware platforms — either new machines or upgraded existing machines," says Jonathan Yarmos, a research analyst at the Gartner Group, Inc. in Stamford, Conn.

Users can choose from several ways to boost current PCs or XTs to 286-based machines. One method is to add a coprocessor board that can access its own 80286 memory but not directly

Unit sales of add-in boards
Projected number of boards sold separate
from personal computers, 1987 to 1991*



INFORMATION PROVIDED BY FUTURE COMPUTING, INC.
CW CHART

access I/O devices on the motherboard. The system's original, slower Intel 8088 processor needs to intervene for all I/O operations.

Give and take

While coprocessors increase the speed of the original system, they also present drawbacks. For example, all of the 80286 board's memory must come with the board, thus increasing the cost. High-resolution graphics are also difficult. Full IBM Enhanced Graphics Adapter (EGA) or Video Graphics Array (VGA) emulation is hard to obtain at an acceptable speed.

Another alternative is to replace the system's original processor with an accelerator 80286 board. The replacement processor is attached via a cable to the socket from which the 8088 has been removed. This method gives the 80286 access to the most recent data through a cache memory, and the processor can emulate an 8088 to request data over the original bus.

These two methods are used to upgrade an 80286-based AT with an 80386 accelerator. The same problems that trouble the coprocessor approach for the 80286 hold true for that approach with the 80386. But use of a coprocessor avoids the necessity of removing the original AT 80286 processor.

Some vendors offer alternatives to these approaches. For example, AOX, Inc. in Waltham, Mass., provides a bus master approach to accelerator boards that resembles the concept behind the new bus architectures, such as the PS/2's Micro Channel. AOX's approach allows add-

in boards to temporarily take control of the bus by combining a cache design with a coprocessor.

Frequently, accelerators are also used for specialized applications.

Sanders Associates, Inc., a Nashua, N.H.-based military defense contractor, uses AI Architects, Inc.'s Hummingboard (an 80386 accelerator) to design interactive video-based training systems. Sanders accomplishes development work on PCs — XTs and ATs or compatibles—

running Microsoft's MS-DOS. In addition to accelerators, the company uses digitzing boards to encode line art and disk controller boards for added storage capability.

Sanders is unlikely to buy the newest PC systems, says Ralph Baer, an Engineering Fellow at Sanders, because the combination of old PCs and boards works well.

"We have all sorts of things clicking together. Why on earth would we want to change to a brand-

new system?" Baer asks. "You can always do things faster and more efficiently, but you can't change every other year."

Effectively using 80386 accelerators with current DOS programs requires software extensions that allow 32-bit processing, says Tom Spaulding, president of AI Architects in Cambridge, Mass.

"The same program that runs in 16 bits on a 386 is $2\frac{1}{2}$ times faster in 32 bits," he says.

Users are installing the company's Hummingboard with DOS extensions for computeraided design (CAD) and artificial intelligence applications. The same CAD applications that run on Digital Equipment Corp. VAX minicomputers and Sun Microsystems, Inc. workstations can now run on a boosted PC, Spaulding claims.

Facing trade-offs

Nevertheless, users running more mundane applications are faced with trade-offs when considering accelerators. Purchasing an accelerator board for currently installed PCs, XTs, ATs or compatibles can save the cost of acquiring an 80286 or 80386 system. But economics is not the only factor involved in such decisions.

"With accelerators, the choice involves economics, the hassle factor and politics," says Julian Horwich, executive director of the Chicago Association for Microcomputing Professionals (CAMP).

Politically, buying an accelerator is often an expedient way to avoid a conflict with management. New software applications may become available within a

year of purchasing a new system. But the applications can run at optimum efficiency only on a more advanced machine with a faster processor — and managers tend to be reluctant to authorize brand-new system purchases within such a short time frame. Luckily, applications can be run with the help of a less expensive accelerator board.

Potential for conflict

The trouble is that adding a new board of any kind to an installed complex of hardware and software applications may cause other problems. "The biggest hassle with any of the boards is that you can get into a conflict with another board or device," Horwich says.

For example, Horwich says when he recently installed a memory board in one of his company's systems, a conflict occurred between the new board and a previously installed LAN board.

"The LAN board refused to work. We had to call one of the vendors and find out how to tell the software for the expanded memory board to access someplace else in memory to avoid conflict with the LAN," he says.

Theoretically, such conflicts can be avoided if all the boards are obtained from a single vendor that guarantees that all the One of the major challenges of the personal computer is accomplishing all the integration."

Evolving to new standards
User interest in accelerators and
in upgrading their current systems is expected to last only as
long as users are willing to make
due with old machines.

"We are presently on a market edge, like the time we moved from the PC to the AT," says Martin Alpert, president of Cumulus Corp., a Cleveland-based PS/2 board vendor. "Whenever there is a market edge, transient opportunities occur. One of those opportunities is alternate processor boards. But as the price of 386-based machines comes down, the market will move from alternate processors in current machines to new machines."

Alpert pegs the life cycle of the "transient opportunity" for alternate processor boards at a year and a half.

Traditional multifunction, basic graphics emulation and accelerator boards are expected to become less popular as users install more PS/2s and machines with PS/2-like functions.

Memory and communications products, however, will be as much in demand for the new systems as they are for the old.

Currently, the average personal computer boasts a memory of between 640K and 1M byte, according to the Gartner Group's Yarmos. OS/2 will require 3M bytes or more, he adds. Local-area networking, already a significant part of users' board requirements, will also receive a major boost from the next generation of PCs.

"I would never proclaim any year 'The Year of the LAN,' but we will finally see some increase in LAN softfunctionality," Yarmos

ware functionality," Yarmos says. "OS/2's communications ability will — if not bring about more boards — certainly cause people to buy the ones out there already."

Board requirements are changing because of new bus architectures and the software to drive them. Whereas once there were two primary bus architectures offered by the leading microcomputer vendors — IBM and Apple Computer, Inc. — today, there are five and possibly more on the way.

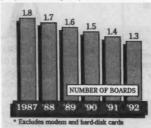
Although IBM stopped mak-

Although IBM stopped making PCs and XTs — and the days of the AT are numbered — IBM's original bus continues to thrive on machines made by vendors of compatibles.

The Apple Macintosh did not offer an open architecture for board vendors' products until

Residence pattern

Average number of projected add-in boards
per personal computer, 1987 to 1991*



INFORMATION PROVIDED BY FUTURE COMPUTING, INC.
CW CHART

products work together. But this scenario is rarely possible because no single vendor supplies all the boards that users require. Usually, one vendor supplies accelerator and memory boards while another offers communications products.

As a result, managers charged with acquiring PC components tend to stick with a few vendors — ones whose products they have worked with through the years — to avoid potential conflicts.

"Once, you used to buy one machine and one set of support products all from the same vendor," Horwich says. "Today, there is more than one kind of personal computer out there. There are four or five types of boards from different vendors in each system and 10 types of software from different vendors.

this year's introduction of the Macintosh II.

'The Mac SE and Mac II are really open systems now, and there is an opportunity for board vendors that didn't [previously] exist," Yarmos says. "With an increased acceptance of Apple in corporations, this is a viable addin market."

Macintosh boards that allow links with other personal computers, host connections, added memory and enhanced displays are all becoming available to Mac

However, some vendors are reluctant to enter the Macintosh market because of the trade-offs involved.

"It is a rapidly growing mar-ket, and there are few barriers," says Robert Brown, president of Quadram in Norcross, Ga. "But it is another segmentation of the board business, and Apple's policy is that they are going to own the popular enhancements and peripherals for their products. You have to be careful which products you choose, or you might get stepped on by Apple.

Alternatives available

Despite IBM's traditional domination of the corporate market, other vendors are joining Apple in offering alternative architectures on new personal comput-

This year, compatible maker Compaq Computer Corp. introduced the Deskpro 386/20 with a 32-bit memory bus based on the firm's Flexible Advanced Systems (Flex) architecture.

The system senarates the memory and peripheral buses, allowing 32-bit access to memory. It also includes a cache memory system.

Research AST also announced a sophisticated bus this year. This action represents part of its first move away exclusively from selling boards to of-

fering personal computers as well. The Smartslot architecture is available on the vendor's Premium/386 system. Like Compaq's Flex, AST's bus provides separate memory and peripheral access. Smartslot also includes an "arbitration circuit" that facilitates the use of intelligent coprocessors

Both the Compaq and AST architectures claim AT compatibildistinguishing them from IBM's Micro Channel architecture, which does not allow compatibility between the PS/2 and

Users not ready to buy into IBM's PS/2 strategy because of compatibility issues welcome the alternatives provided by other vendors. For example, Sundstrand recently bought about 40 AST Premium/286s.

We're buying the ASTs

rather than PS/2s because of the availability of the boards and the cost savings," Sundstrand's Wilt says.

For companies replacing their current systems with PS/2s, the Micro Channel architecture means less boards in the short term and, in the long term. the ability to take advantage of new board functions.

Travelers Insurance Co. in Hartford, Conn., is switching to a personal computer standard based on the PS/2 Model 60. The company acquired about 500 systems this year to replace its PC ATs.

"Every AT had an EGA board and a memory board with 128K bytes installed. That made them EGA-capable 640K-byte machines," says Lee Nolan, project manager at Travelers. "Those functions are both taken care of on the PS/2. You have 1M byte of memory and a VGA all built in. That certainly decreased our board business

Because of plans to run OS/2 Extended Edition when it becomes available, Travelers is acquiring 2M-byte memory boards for many of its PS/2s and remaining ATs. For communications, the company uses Digital Communications Associates, Inc.'s Irma 3270 micro-to-mainframe and IBM Token-Ring LAN hoards

In going with the PS/2, Travelers says it was more interested in the system's potential than it was concerned about incompati-

Switching from the AT to the

HE MICRO Channel has more value because of the new genres of boards. It is a nicer platform to develop on than the classic bus, and third-party suppliers will respond.

> JULIAN HORWICH CHICAGO ASSOCIATION FOR MICROCOMPUTING PROFESSIONALS

PS/2 provides users with a higher processor speed, a larger hard disk and higher throughput potential, Nolan says.

"The machine setup is easier from the hardware viewpoint. because there are no switches to set or jumpers to change. There are much better graphics, a better monitor and higher resolution. What m want?" he asks. What more could you

Nolan says the transition to the PS/2 is a lot less traumatic than is often portrayed. "There was a fair amount of change from the PC's 8-bit bus to the AT's 16-bit bus," he says, "but every-

body just kind of ignored it.' At that time, suppliers of I/O boards did not change their products to accommodate the new bus, but the memory board makers had to switch from 8 to 16 bits because the PC boards were

unworkable on the faster ATs.

Everyone had to redesign their memory adapters. Did you hear anyone screaming then? Nolan asks. "This change only appears to be different because it forces you to go back and redo the hardware.

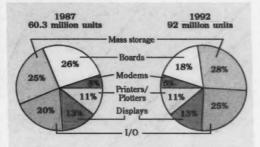
Awaiting next generation New architectures like IBM's Micro Channel will provide platforms for the next generation of more users. With the Micro Channel and bus master boards, the throughput is improved to the degree that users get better response and more workstations can be added."

working concurrently may pave are software drivers to go with them. For this reason, board de-

While multiple processors

the way for more sophisticated applications, the boards will not be popular with users until there

Shrinkage in board peripherals segment U.S. unit sales are projected to decline as a percent of all peripherals sales between 1987 and 1992



INFORMATION PROVIDED BY FUTURE COMPUTING, INC.

"The new Mac II bus and the Micro Channel are both multimaster buses. You can plug in multiple processors, and any processor can take control of the bus," AI Architects' Spaulding

On AT-type systems, the CPU is the only master of the bus, and other boards are not al-

lowed to take control. This means that throughput slowed to the speed of the AT.

"We can put up to four Humming boards into an AT. but because of the limited bandwidth. the throughput is quite slow. You can't really do parallel processing in which you share tasks

among processors," Spaulding

Multiprocessor boards with bus master capability should be available by the end of 1988 or 89, Spaulding predicts.

Board suppliers are now working on multiprocessors to enhance networking, graphics and multiuser applications. One function is to increase system throughput by transferring control between the PS/2 CPU and add-in boards armed with their own specialized processors.

"On a given processor, you could have a certain number of workstations attached in a local-area network," says Jim McClellan, IBM's manager of strategic and systems planning for the Personal System line. "After you get past a certain number of workstations, the throughput is so degraded you can't add any

velopers are working with software vendors to develop applications in this area.

'The software implications of concurrent processors are a little troubling," says Ken Bosom-worth, president of International Resource Development, Inc., a Norwalk, Conn., market re-search firm. "While the hardware folks can see how to build such things, getting software to take advantage of them is quite difficult. You end up with a coprocessor and the memory and the main processor needing to continually wait on each other.

Users are equally unim-pressed with the short-term implications of multiprocessors, but, in the long run, they see productivity improvements

"Today, the PS/2 is a problem because of the new types of boards you have to buy," CAMP's Horwich says. "In the long term, the Micro Channel has more value because of the new genres of boards - I/O processors, better graphics processors. It is a much nicer platform to develop on than the classic bus, and the third-party suppliers will respond."

Scholarly caution

At Loyola University of Chicago, users work with a variety of personal computers, including IBM PCs, XTs, ATs and compatibles and a few 386-based machines.

Each year, the university doubles its microcomputer population; it jumped from about 600 or 700 last year to 1,300 this year. As the school adds new types of systems, more sophisticated boards are required.

'Most of the boards for the compatibles are now performing connectivity functions, whereas

in the past, boards were used to beef up the workstation itself,' says Don Wee, information center analyst at Loyola.

Despite user interest in new ersonal computers, such as the PS/2, Loyola's information systems department is taking a cautious approach to acquiring the new systems until applications are developed.

'My hope is that the design of the bus to allow cooperative processing will open up all sorts of new things we haven't even dreamed of yet." Wee says.

Even at Sundstrand, where AST compatibles are being installed as an interim solution, users hope that new developments will make the architectures more attractive.

"If boards come out to do some of the things that take time now - like screen updates and high-resolution graphics - we'll be immediately interested in them," Wilt says. "As soon as users say they need three processors on one machine to run a certain function, we'll reevaluate our AST standard

Where's the support?
In the meantime, Wilt and other managers are concerned about more basic problems. "No matter which third-party manufacturer it is, if you call them with a support problem that requires more than basic information, they won't be able to help you,"

The standard response from vendor support personnel is to tell users to check whether the board is installed properly, Wilt adds. For more sophisticated users, the issue is usually a problem of conflict rather than something simple.

"I find it very discouraging having to train the support person when I'm calling for help," Wilt says.

In many cases, vendors are responding to such complaints with stepped-up programs.

"Vendors are ramping up on service and support because they realize how important it is to maintain existing customer loyalty and to make sales to more sophisticated users," Future Computing's Young says.

Business declined substantially after the April 2 announcement [of the PS/2]," says Daniel Klein, an Atlanta-based distributor of add-in boards to Fortune 500 companies. "Corporate users needed time to digest what IBM introduced, and most people put a freeze on buying new systems until they evaluated the PS/2.

Now, users are coming to the end of their evaluations, and board makers are gearing their development toward the future.

"I'm hoping I'll be pleasantly surprised by what develops. Loyola's Wee says. "Right now, though, I'm not expecting anything to knock my socks off in the coming year." .



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products can support the DCA and IBM mainframe file transfer software you probably already have installed in TSO, CMS and CICS environments.

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Shift seen for graphics boards

The market for add-in graphics boards has exploded in the last several years, fueling the coffers of some 100 vendors.

But now the Personal System/2 offers integral graphics the Video Graphics Array (VGA) standard - which offers a basic 16 colors at 640- by 480-pixel resolution and an optional 256 colors at a 320- by 200-pixel res-

VGA has altered the outlook for the graphics board industry. At minimum, VGA portends a gradual erosion of the market and the certainty of a shakeout for vendors at the low end.

Board makers' blues

IBM's announcement of the graphics-rich PS/2 could not have come at a worse time for many U.S. board manufacturers.

margins, already Profit squeezed by pressures on the volume marketing channels, were further compressed by price competition from factories in Southeast Asia.

"Margins on Enhanced Graphics Adapter products have eroded to the point that it is no longer viable to produce them. laments Jim Harris, president of board maker Hercules Computer Technology in Berkeley, Calif.

Now the PS/2 has given vendors additional headaches by surface area on which chips can be placed - to roughly 30% less us," Burkman says.

Of course, the advent of the PS/2 will not entirely eradicate the market for graphics boards.

Indeed, vendors of such products see opportunity among PS/2 alternatives, such as Apple Computer, Inc.'s Macintosh II and the PC clones.

Some 14 million PC. XT and AT clones are now installed, indicating a substantial potential base for sales of graphics board enhancements.

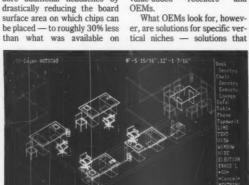
Still, some major changes in marketing strategy will need to be

A good deal of proddifferentiation in the low-end segment of graphics add-in

board market has been based on price. These boards were massproduced for a horizontal marketplace and sold via dealers, distributors and retail outlets.

The OEM factor

Now, many graphics board makers are seeking to improve margins through arrangements with value-added resellers and



Floor plan, created using Autocad and the Hercules In Color

IBM's Personal Computer XT; 50% less than on the PC AT. What that does, explains Bill Burkman, director of marketing for Orchid Technology Co. in Fremont, Calif., is force a choice between restricting the number of features per slot or intensifying the circuit integration.

'IBM hasn't made it easy on

come from adding value, not just power, to application software. Tapping the OEM market will

require research and develop-ment, Harris says. "We will do it by coming up with innovative technology that will enhance the capability of the developers' software, either in terms of graphical performance or on-screen information capabilities,"

"You either play a dollars game or you move to the high end to survive," agrees Mike



Caster wheel model, created on an IBM Personal Computer AT running Control Automation's Model Mate, enhanced with Orchid's Turbo PGA graphics adapter.

Clotiaux, special projects director for Houston-based high-end board maker Omnicomp Graphics Corp. Clotiaux defines "high end" as areas such as graphics imaging, process control, medical diagnostics, computer-aided design, simulation and modeling, computer-aided manufacturing, computer-aided software engineering and computer-integrated manufacturing.

Vendors now operating in the mid-range and high end of the graphics board market will have to cope not only with a flood of new competition from companies attempting upward diversification but also with a different kind of competition from IBM. They will vie not with VGA but with the IBM 8514 display, which boasts a pixel resolution of 1,024 by 768 on the PS/2.

The market for boards with 1,024- by 768-pixel resolution will erode, some analysts say, because of IBM's 8514 entry.

Sohail Malik, an analyst at Dataquest, Inc. in San Jose, Calif., says,"IBM has done what I call 'leading from the rear' by offering significant quality and capability. This forces vendors to enhance their products before there is an installed base.

"As the monitors come down in price, we will be playing both a resolution game and a performance game, says Steven Levy, business development manager at Vermont Microsystems, Inc., a graphics add-in board manufacturer in Winooski, Vt.

All sectors of the graphics board market show room for growth, at least through early 1989, Malik says. But vendors are already feeling the pressure, and after that point, all bets are

VENDOR VIEWPOINT

Graphics upgrades: A wise investment

BY PAUL JAIN



As is always the case when IBM makes a major product announcement, a

host of computing standards were created when the Personal System/2 debuted last April. In keeping with tradition, Video Graphics Array (VGA) became the de facto graphics standard when IBM incorporated it into the motherboard of its PS/2 Models 50, 60 and 80.

Just because IBM has decided that VGA is important does not mean that MIS professionals will automatically run out and upgrade their installed personal computer base to the graphics equivalent of PS/2.

There are, however, at least three compelling reasons for MIS to consider that upgrade or, at the very least, mull over an upgrade to an Enhanced Graphics Adapter (EGA). These include increased employee productivity through the use of a graphics interface, preparedness for future releases of powerful application software packages and insurance for the investment of installed PCs and PC-based application software.

One reason the Apple Computer, Inc. Macintosh penetrated the Fortune 500 is the computer's easy-to-use graphics interface. With a mouse, users interact with the computer, selecting the commands they want by moving the pointer to the command and clicking the mouse. This is certainly easier than entering programming codes to execute the same command on a DOS-based PC.

With the help of a graphics interface, employees no longer have to think about "using" the computer and can focus their attention on the task at hand, thereby enhancing efficiency and productivity.

Even word processing becomes easier when the user can see italics as italics on the screen instead of odd coding before and after the word.

Making it easier

IBM realized that its computers were difficult to use. So when introducing the PS/2 line, IBM announced it would take advantage of OS/2 and Presentation Manager in an attempt to make its computers more user friendly.

Jain is president and chief executive officer of Video Seven, Inc., a graphics board manufacturer in Fremont, Calif.

Presentation IBM's version of Microsoft Corp.'s Windows, makes an IBM computer operate much like a Macintosh. However, to run that software, and take full advantage of the machine's multitasking capabilities, the computer needs to be equipped with at least an EGA card. Since IBM introduced EGA three years ago, third parties have had time to improve on it. In response to these enhancements, IBM increased the resolution and performance of EGA to bring it to the level established by third parties. The company reintroduced EGA with PS/2 as VGA. The PS/2 announcement made 640- by 480pixel resolution a new standard for PC graphics.

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Applying applications
Most of the software applications that will appear on the market in the next two years will be written for use with VGA. Software developers are already busy writing programs to take advantage of the advanced capabilities of the PS/2, including the new graphics standard.

Many of the new programs will not run on the old monochrome displays or even on Color Graphics Adapters (CGA). For application programs, including advanced versions of popular spreadsheet, data base and word processing programs,

VGA is a must.

In addition to protecting the installed base of more than 10 million PCs now in use, it is also necessary to consider the investment in software designed for previous graphics standards. VGA boards that feature backwards compatibility allow users to run the new high-powered software applications specifically designed for VGA, while also running all software applications designed for EGA, CGA, Monochrome Display Adapter and the Hercules Computer Technology, Inc. Graphics Card.

The most obvious difference between the PS/2 and IBM Personal Computer ATs and XTs is what appears on the monitor. The PS/2's graphics equal, or exceed, those of the Macintosh.

However, it will take more than good looks to convince MIS professionals to spend money for a trade-up. A hard look at what graphics can mean to a company will, however, soon convince the most skeptical MIS professional that upgrading PC graphics is an investment that makes sense. •

Messenheimer is an independent consultant and writer based in Natick. Mass., specializing in advanced technology assessment and implementation.

PC facsimiles are offering direct document input

BY TOM CROSS

Facsimile, or telecopy systems, better known as fax, have been in widespread use for more than 70 years. By some estimates, as many as four million fax machines are already scattered throughout the world — two million in the U.S. alone.

Personal Technology Research, Inc. in Boston estimates that close to one million fax machines will be sold in 1992, the majority of which are the subminute CCITT Group III systems. The adoption of a worldwide standard, coupled with subminute speed, has been a principal force in the recent growth of facsimile systems.

The latest fax technology twist is an add-in board that fits personal computers. PC fax boards, which fall into CCITT Groups II and III, enable documents to be sent and received as easily as they would on a stand-alone machine. According to International Data Corp. in Framingham, Mass., while just less than 17,000 PC fax boards will be shipped this year, that figure will grow to 187,000 by 1991.

Some 16 vendors currently manufacture a variety of PC fax products. But the market is still young and growing: An estimated 15 PC fax boards were introduced at Comdex/Fall '87 in November.

Two of the leading-edge products in this category are Gammafax from Gammalink Co. in Palo Alto, Calif., and Ez-Fax from DEST Gulfstream Microsystems, Inc. in Boca Raton, Fla.

The simplicity test

The real test of a product is its simplicity
— whether it can be taken out of the box
and used without difficulty. Both Gammafax and Ez-Fax, which consist of a board,

Cross is vice-president of Cross Information Co. in Boulder, Colo., and the author of several books on communications.

software and relatively straightforward manuals, are easy to set up.

In both cases, the user simply installs the board in an available slot. Minutes after software installation, the boards are ready to receive transmissions.

Both PC fax boards incorporate a telephone Y-jack to bridge the PC fax board and the telephone set. If you have one of the latest generation telephone key or private branch exchange sets, however, this jack probably will not work, and a separate line may have to be installed.

Each product's software offers key- or menu-driven functions — allowing you to send or receive, convert from ASCII to fax, print, display or scan (with an optional scanner) — and many other features.

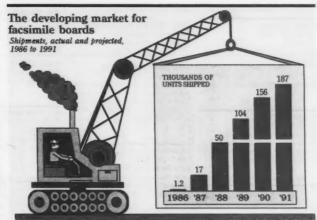
Good with the bad

Gammafax software incorporates one quite useful feature. It automatically changes the AUTOEXEC.BAT file, which configures the PC to access peripherals. Ez-Fax provides a more concise onscreen presentation; however some of its features are not as accessible as those of Gammafax, which uses F1 keys, making all features accessible with a keystroke.

PC fax boards, relatively new to the marketplace, are still somewhat unstable. Gammafax and Ez-Fax are no exceptions. During trial runs, both locked up the system, necessitating a warm reboot.

The benefit most often mentioned by PC fax board users is savings in time. Both Gammafax and Ez-Fax certainly serve that end, but they also offer an extensive array of features that advance productivity and convenience. For example, both offer a wide selection of diagnostic and error-correction features.

Furthermore, both boards interface to some of the available "paint" software for



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: MITCHELL J. HAYES

graphics communications and major word processing packages. This allows facsimile documents to be integrated with word processing and then printed or filed for fax, electronic publishing, PC communications and other desktop applications.

Ford or Chevy

Both Gammafax and Ez-Fax allow users to get started quickly, transmit facsimile in the background while still working in the foreground and access the document once it is in the PC. The differences between the two are similar to the distinctions between a Ford and a Chevy — more matters of individual preference than of functionality.

The Gammafax system provides a feature that enables the document to rotate 180 degrees in case it was faxed upside down. Another nice feature in both systems is their ability to electronically magnify documents. This feature can be particularly helpful when resolution is poor or a faxed document is illegible.

Ez-Fax's structured menus, on the other hand, make it easier to use. It has an encryption feature, using the National Bureau of Standards Data Encryption

Standard. For modern diehards, it also has a built-in Hayes Microcomputer Products, Inc. 300 bit/sec. to 1,200 bit/sec. modern.

The greatest benefits of these or any other fax boards are apparent when they are connected to other equipment. When an external scanner is used or a PC-based board is set up to accept dial-in communications from another fax machine, all correspondence can be put into the PC. Then, if a filing program or DOS directory exists, the PC can function as an electronic desk.

Separate on- and off-line paper filing systems are not necessary. Everything can be put into the PC, copies can be made available both on-screen and by printout and documents can be archived for maintenance and accountability.

One of the most exciting prospects for PC fax boards involves their use in LAN configurations. A fax board can be installed on a file server and shared among all the workstations.

While PC fax boards may not replace fax machines, they will certainly move the facsimile out of the warehouse or mail-room and into the front office. ●

Memory expansion boards

Action Instruments, Inc. (619) 279-5726

A 20M-byte hard-card fixed disk for IBM Personal Computer XT, AT and compatibles.

AICP-MEM502

A 512K-byte random-access memory expansion card for AT and compatibles.

AICP-384COM

A 384K-byte RAM expansion board for XT and compatibles.

Advanced Logic Systems (408) 747-1988 Add-RAM, Add-RAM GS, 80/256, 80/64

Series includes 16K- or 48K- to 64K-byte memory upgrade, respectively, for the Apple Computer, Inc. Apple II and II Plus; and 256K- or 64K-byte memory upgrade, respectively, for the Apple IIe.

Apple Computer, Inc.
(Contact local Apple dealer)
Apple Memory Expansion Kits
The 1M-byte kit adds up to 1M byte of memory to Macintosh II. The 2M-byte kit adds up to 2M bytes of memory to any Macintosh.

AST Research, Inc. (714) 553-0340 RM4

Adds 1M to 4M bytes of memory to Apple Computer, Inc. Macintosh II.

ATD/Zuckerboard, Inc. (408) 720-1942

Primary, Secondary Memory Boards
Memory expansion for IBM Personal Computer, XT, AT and compatibles adds 128K bytes to starting address of 512K bytes. Snap-on secondary board adds additional memory.

Zuckerboard Expansion Memory Board Half cards that expand the IBM PC, XT, AT or compatibles' memory to 640K bytes. Expanded Memory Zuckerboard Provides Lotus/Intel/Microsoft Expanded Memory Specification for PC, XT, AT and compatibles; can be loaded with up to 2M

bytes memory.

Aristo Computers, Inc.
(713) 480-6288
640K Motherboard Upgrade for IBM
PC XT
Consists of two plugin deceding chire. Up

Consists of two plug-in decoding chips. Up to 640K-byte upgrade.

640K Motherboard Upgrades for Compaq Portable, Zenith machines, IBM Personal Computer

Compaq upgrade consists of plug-in decoding chip. Upgrade for Zenith 150, 151, 161 similar to Compaq upgrade. IBM upgrade consists of a plug-in module and two memory connectors.

Boca Research, Inc. (305) 997-6227 Tophat, Tophat/12

A 16-bit short card designed to enable IBM Perscral Computer AT and compatibles up to 8 MHz (12 MHz for Tophat/12) to reach the maximum 640K bytes.

Bocaram/XT, Bocaram/AT Expanded memory board for IBM PC, XT, AT and compatibles operating at up to 12 MHz. Bocaram/AT offers AT, XT/286 and true 16bit compatibles conventional, cxpanded and

extended memory.

Cheetah International, Inc.
(800) CHEETAH
214-757-3001 (in Texas)
Cheetah Card, Cheetah Combo,
Cheetah 8 Crate, Cheetah Cub
All run on Intel Corp. 80286- and 386-based
IBM Personal Computer AT machines. Offers
zero-wait-state extended memory of 2.5M,
1.5M, 8M and 2M bytes, respectively.

CSS Laboratories, Inc. (714) 852-8161 Turbo RAM

For IBM Personal Computer XT/286 and CSS 286-X computers. Provides up to 2M bytes memory.

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Cumulus Corp. (216) 247-2236 CU-RAM

Memory for IBM Personal System/2 supports Lotus/Intel/Microsoft Expanded Memory Specification (EMS) 3.2, EMS 4.0 and Enhanced EMS protocols.

Digiboard, Inc. (612) 922-8055 Digiboard RAM/3M byte
For IBM Personal Computer AT and compatibles providing up to 3M bytes error-checked RAM.

Dove Computer Corp. (919) 763-7918 Mac Snap

Memory upgrades for Apple Computer, Inc. Macintosh. Various mod-els add 2M bytes RAM to Mac 512K, 4M bytes to Mac Plus and SE 8M bytes to Mac II.

Ehman Engineering, Inc. (800) 257-1666 Ehman Macintosh Upgrade Adds 256K chips to an Apple Computer, Inc. 128K-byte board to make it a 512K-byte board. Upgradable to 1M or 2M bytes.

Electro Design, Inc. (619) 471-0680 Memcard PC Compatible 64K-

256K Memory Single-function memory board for IBM Personal Computer XT and IMP Professional. Available in 64Kbyte increments to 256K bytes.

Everex Systems, Inc. (800) 821-0806 (800) 821-0807 (Calif.) Multifunction EMS Runs on IBM Personal Computer XT, AT and compatibles. Total 1M-

byte memory expansion.

RAM 2000, RAM 3000 Deluxe Runs on AT and compatibles. Total 2M or 3M bytes of memory expansion, respectively

RAM II 2000, RAM II 4000 Runs on IBM Personal System/2 Models 50 and 60. Adds 2M bytes or 2M to 4M bytes memory, respec-

Maxi Magic EMS Runs on IBM PC, PC XT and compa-tibles. Adds 2M bytes of memory.

Fortron Corp. (408) 432-1191 Fortron 2M-byte, 4M-byte **RAM Cards**

A 2M- or 4M-byte expansion hoard for Intel Corp. and Intel-compatible 80386 microcomputers

TRM (Contact local IBM sales office) IBM 2M-byte Expanded Memory Adapter Provides 2M-byte expanded memo

ry for IBM Personal Computer XT, AT, 3270-PC, 3270-PC AT and Per-

onal System/2 Model 30.

IBM PS/2 80286 Expanded Memory Adapter/A A 2M-byte memory adapter for the PS/2 Models 50 and 60.

IBM Enhanced Memory **Expansion Adapter**

Provides expanded memory for soft-ware that adheres to Lotus/Intel/ Microsoft Expanded Memory Speci-fication 3.2. Can be installed in an AT or PC XT/286.

Ideassociates, Inc. (617) 663-6878 Idea Supermax/MC Adds up to 12M bytes extended memory to IBM Personal System/2 Models 50, 60 and 80 in one slot.

Idea Supermax 30 Adds up to 8M bytes Expanded Memory Specification to IBM Personal Computer, XT and PS/2 Mod-

Idea Supermax/EMS Expands IBM PC, PC XT, AT and compatibles from 512K- to 16Mbyte memory

Ideamax/30, Ideamax/MC Same as Idea Supermax 30 and Supermax/MC but without ports.

Ideamax 384, Idea Minimax Adds 64K to 384K or up to 512K bytes RAM, respectively, to IBM PC, XT, AT or compatibles.

Image Technology, Inc. (303) 799-6433 Short RAM Card II Contains 256K to 512K bytes dy-namic RAM for IBM Personal Com-

puters or compatibles

Intel Corp. (800) 538-3373 Above Board 2 for IBM PS/2 Provides Lotus/Intel/Microsoft Exded Memory Specification and IBM OS/2 expanded memory to 2M oytes for IBM Personal System/2 Models 50 and 60.

Above Board 286, Above **Board PC**

Memory expansion board for IBM Personal Computer AT and compa-tibles (PC, XT and compatibles for Above Board PC) running up to 12.5 MHz and the IBM PC, XT, PS/2 Model 30 and compatibles running up to 8 MHz.

Levco Corp. (619) 457-2011 One Plus One, Monster Mac A 2M-byte expansion board for the Apple Computer, Inc. Macintosh Plus and 1M- to 2M-byte expansion board for the Mac 128K or 512K, respectively.

Mac Doctor Electronics, Inc. (415) 964-2131 Brainstorm Series Brainstorm adds memory from 1M

to 4M bytes to the Apple Computer, Inc. Macintosh 128K, 512K or 512E. Brainstorm XE adds 2M, 4M or 8M bytes memory to the Mac Plus, SE or II. Brainstorm II adds 1M byte memory to Mac II.

Mac Memory, Inc (800) 862-2636 Macplus Mega

Adds 2M bytes of memory to Apple Computer, Inc. Macintosh Plus.

Multi-SIMMS

Memory expansion for the Mac Plus, SE or II in sets of 2M bytes.

Mac Peak Systems, Inc. (512) 327-3211 Plus-RAM

Adds 2M bytes memory to Apple Computer, Inc. Macintosh Plus, SE or II

Mac Products USA, Inc. (512) 832-0335

128K to 4M byte Upgrade Upgrade offered in two configurans: Incremental expansions include 128K to 4M bytes for Apple Computer, Inc. Macintosh 128K and Computer, Inc. Macintosn 128K and 512K to 4M bytes for Mac 512K, 512E, Plus and SE. Upgrades in-clude 2.5M byte or 4M bytes for Mac SE, II or Plus and 5M byte or 8M bytes for Mac II.

MDIdeas, Inc (415) 573-0580 Octoram, Octoram ESP RAM cards for Apple Computer, Inc. Apple IIGS. Former offers 8M-byte RAM extension. Latter offers

512K-byte static RAM expansion.

Megahertz Corp. (801) 485-8857 Ala Card/2

Memory upgrade for IBM Personal System/2 Models 50 and 60. In-cludes 2M bytes of Lotus/Intel/Microsoft Expanded Memory Specification.

Microtek, Inc. (619) 569-0900

GL 640 Plus

Provides up to 2M bytes paged

Computer AT, AT&T PC 6300 and most com-

GL 1460 A 2M-byte expanded memory board for XT, AT and compatibles.

GL 1425, GL 1430, GL 1440 A 2.5M-, 3M- or 4M-byte extended memory board, respectively, for AT and compatibles

GL 1476 Up to 576K of conventional RAM. Fills PC, PC XT and compatibles to

The BAM-16MM Provides 16K bytes additional RAM for Apple Computer, Inc. Apple II with 48 bytes RAM.

Microvoice Communications. (916) 722-5158

Arctic Mac A 2M- to 8M-byte memory upgrade for the Apple Computer, Inc. Macintosh Plus, SE or II.

Microway, Inc. (617) 746-7341 Megapage

Memory expansion board for the IBM Personal Computer, XT and

Monolithic Systems Corp. (303) 790-7400 Just RAM/AT, Just RAM/ATZ

Memory board for IBM Personal Computer AT and compatibles. Just RAM/ATZ uses socketed, 1M-byte

Just RAM/ATX Provides up to 16M bytes of memory plus the option of adding 128K bytes of conventional memory for backfill.

National Semiconductor Corp. (408) 721-8093 NS8/16

A 16M-byte expansion board for the Apple Computer, Inc. Macintosh II.

NIC Technology, Inc. (408) 980-9511 For IBM Personal Computer XT and compatibles. Includes memory to bring from 0K to 640K bytes.

A 4M-byte Lotus/Intel/Microsoft Expanded Memory Specification card for AT and compatibles.

CT-8080A A 3M-byte memory expansion card for the AT and compatibles.

Open Mac Enterprises, Inc. (415) 682-0440 RAM Plus 2, RAM Plus 4 Adds 2M or 4M bytes of memory, respectively, to Apple Computer, Inc. Macintosh Plus.

RAM II, RAM II Plus II RAM II adds 2.5M bytes of memory to Mac Plus or SE. RAM II Plus adds 4M, 5M or 8M bytes of memory to Mac Plus, II or SE

Adds 2M bytes of memory to Mac II.

PC Tech, Inc. (612) 345-4555 4 Megger, 16 Megger Offers up to 4M or 16M bytes, respectively, of expanded memory to IBM Personal Computer, XT, AT and compatibles

Profit Systems, Inc. (313) 647-5010 Elite 16 system memory from 512K to 16M bytes on Intel Corp. 80286- and 80386-based micros.

Quadram Corp. (404) 923-6666 Liberty-PC, Liberty-AT Liberty-PC offers up to 2M bytes expansion to IBM Personal Computer, XT and compatibles. Liberty-AT offers 4M bytes to AT and compati-

Quadboard-AT Memory expansion to 3.5M bytes with two 1M-byte boards for AT and n to 3.5M bytes

Expanded Quadboard Memory expandable to 384K bytes for XT and compatibles.

Silver Quadboard RAM expandable in 64K-byte increments to 640K bytes

Short RAM Memory expansion to 384K bytes.

STB Systems, Inc. (214) 234-8750 **Grand Byte**

For IBM Personal Computer AT and high-speed compatibles. Maximum expansion 2.5M bytes.

For IBM Personal System/2 Models 50 and 60. Memory can be conventional, extended or expanded.

Super Mac Technology Corp. (415) 964-8884

Adds 2M bytes of memory to Apple Computer, Inc. Macintosh 512K

Super RAM II, Super RAM IV Adds 1M to 2M or 2M to 4M bytes of memory, respectively, to Mac

Tandy Corp. (817) 390-3700 **Tandy Memory Expansion**

A board for Tandy 4000. Comes with 2M bytes memory, upgradable to 4M or 8M bytes.

Tecmar, Inc. (216) 349-1009 Micro RAM, Micro RAM + 2 Adds 512K- to 8M-byte memory expansion to IBM Personal System/2 Models 50, 60 and 80. Micro RAM+2 expandable in increments

Total Systems Integration, (503) 345-7395

of 512K or 2M bytes.

TSI-206S Adds 1M-byte memory to Apple Computer, Inc. Macintosh Plus, SE

128K-512K, 128K to 1M byte Upgrade Adds up to 512K or 1M byte memory, respectively, to Mac 128K.

Viasyn Corp.
Compupro Division
(415) 786-0909
RAM 22, 23, 24
Static RAM boards that support processors up to 10 MHz. RAM 22 ad-

dressable on 256K-byte boundaries; RAM 23 on 64K-byte boundaries; RAM 24 on 1M-byte boundaries only.

Accelerator boards

A. A. A. C.	COMPANY	PRODUCT	RUNS ON	MICROPROCESSOR	WORKS WITH/REPLACES MICROPROCESSOR CHIP	CLOCK SPEED (MHZ)	PERFORMANCE IMPROVEMENT	INSTALLATION METHOD	FULL SUPPORT FOR COPROCESSORS	INCLUDES NUMERIC COPROCESSOR	DEDICATED RANDOM-ACCESS MEMORY	AMOUNT AND TYPE OF DEDICATED RAM	SOFTWARE COMPATIBILITY LIMITS	WARRANTY OFFERED	PRICE
April Companies and 200 Uniform Companies	617) 577-8062	386 Humming Board	IBM PC, PC XT or 386 compatibles	80386	Works with	16, 20	2,000% (depending	Plug-in	Yes	Optional	Yes	1M-24M byte DRAM ³		90 days	\$2,195- \$17,500
Applied Reasoning Corp. Comment Corp.	American Computer and Peripheral, Inc.	386 Turbo	IBM 286 AT or compatibles	80386	Replaces	(doubles the	300%	Plug-in	Yes	-	No	NA	None	One-year, parts and labor	\$1,199
Applicate Resource Curp. Comparison Application A Tend comparison Application A Tend comparison Application Appl		Manter386		80386	Works with	16, 20	200%-	Playin	Yes	Optional	No	NA	1225	parts and labor, replacement boards, 15-day money-back	\$1,595- \$2,195
Clarestab Interessational, CAT286 SMA AT and Comparables SMA AT and Comparable SMA AT and Comparabl	Applied Reasoning Corp. (617) 492-0700	PC- Elevator 386		80386	Works with	16		Plug-in	Yes	Optional	Yes	1M byte (ex- pandable)		One-year on hardware, 90 days on software, parts	\$1,995
Capering Comparing Compa		PC-Elevator 286		80286	Works with	8, 10, 12.5		Plug-in	Yes	Optional	Yes		None	One-year on hardware, 90 days on	\$995-\$1,79
Dave Comparter Corp.	Inc. (800) CHEETAH, in TX call	initial med interior		80386	Replaces	Tenter.	40016	Repinces mother- board	Yes	Optional	Yes	Up to 16M bytes	alth	One-year, parts	\$1,495
Mac Stap 0.00 Macinton h Plun. 512E Morks with 16 250% 510% 512E 500% 512E 512E 500% 512E 512	Dove Computer Corp.	Mac Snap 020	Macintosh SE	68020	Works with	16	250%- 1,000%	Plug-in	Yes	Optional	No	NA	None	complete replacement or	\$899
Exercise Systems, Inc., Expositer Ex		Mac Snap 020		68020	Works with	16		Snap-on	Yes	Optional	No	NA	None	90 days, complete replacement or	\$999
Macintonh SE 68020 Works with 16 400% Phug-in Yes Optional Varies Optional Optional None Optional Option	Everex Systems, Inc. (415) 498-1111	Expediter		80286	Réplaces	8	1-3/2	Plug-in	Optional	Optional	Yes	256K	None	One-year, parts	\$399
Inhorard 386/PC IBM PC, PC XT, Compage Pertables, Compage Pertable	General Computer Corp. (617) 890-0880	020		68020	Works with	16	400%	Plug-in	Yes	Optional	according	compatible	None	90 days, parts	\$999-\$1,69
Inhoard 386/FC Compag Pixal, Compag Pixal, Tarby 1200 MD Replaces 16 800% Plug-in, clip- Yes Optional No	Intel Corp. (800) 538-3373	Inboard 386		80386	Replaces			Plug-in	Yes	Optional	Optional	As much as 1M byte DRAM	Nome	Pive-year, purts and labor	\$1,595 (without optional memory)
Replace Section Replace Replace Section Replace Section Replace Replace Section Replace Repl	n i san an a	Inboard 386/PC	Compaq Portable, Compaq Plus.	80386	Replaces	16		Plug-in	Yes	Optional	Yes	1M byte DRAM	None	Five-year, purta and labor	\$995
Siz Plus P	K & L Industries, Inc. (412) 882-6700	Turbomax	IBM PC, PC XT,	8088-1	Replaces	9.54			Yes	Optional	No	NA	None	replacements	\$159
LSE Electronics XT 12 MHz V20 Motherboard Motherboard Motherboard Motherboard Motherboard Motherboard Motherboard Macintosh SE Macintosh SE 68000 Replaces 16 100% Flag in Yes Yes Yes Wes Warranty Macintosh SE Macintosh SE 68000 Replaces 16 100% Clip-on Yes Optional Yes Boosts 512 or Fall, one-year games Macintosh Flas Macintosh	Levco Corp. (619) 457-2011	745	Macintonh 128, 512, Plus, SE	68020	FE SECTION	16	1,000%	(Plus, 512.	Yes		Yes	bytes with co-	None	your extended	\$1,499- \$3,499
Turbemax Macintosh 512KE or Macintosh Flus G8000 Replaces 16 100% Clip-on Yes Optional Yes Boosts 512 or Flus to 2M over the standard price of Macintosh Flus S1,4 one-year one of Macintosh SE G8020 Replaces 16 400% SE bus Yes	(516) 931-1670	Motherboard						mother- board					None	One-year, parts and labor	
Orion 25 Macintosh SE 68020 Replaces 16 400% SE bus Yes Yes Yes Up to 256K bytes: 1M-or 4M-byte sinking Orion 25 Macintosh SE 68020 Replaces 25 800% SE bus Yes Yes Up to 256K bytes: 1M-or 4M-byte sinking Orion 25 Macintosh SE 68020 Replaces 25 800% SE bus Yes Yes Up to 256K bytes: 1M-or 4M-byte sinking Orion 25 Macintosh SE 68020 Replaces 25 800% SE bus Yes Yes Up to 256K bytes: 1M-or 4M-byte sinking Magaberts Corp. (801) 485-8857 Fing-in Yes Optional No NA None Tell, one-year funds warranty warra	Macmonry, Inc. (800) 862-2636	scalo, or		Mil Te	n flee to	444	17.70	19 3 3 3	MS				games	warranty	\$599 (without coprocessor
Mac Peak Systems, Inc. Orion Macintosh SE 68020 Replaces 16 400% SE bus Yes Yes Yes Up to 256K bytes; 1M-or Macintosh SE SE SE SE SE SE SE SE		ar bedson a brakks a ha san an ana			that egalled	of brooks			Tes	Optional	Tes	Plus to 2M bytes; can boost to 4M			\$1,499 (without reprocesses
bytes: IM-or 4M-byte SIMM warranty not 4M-byte SIMM None Two-year, 81 May 1485-8857 Switch II BM PC AT NA Works with 6-12.5 50%-75% Plug-in Yes Optional No NA None Two-year, 81 money-back guarantee PC/XT Turbo Switch II BM PC PC XT NA Works with 4.77-9 50%-75% Plug-in Yes Optional No NA None Two-year, 81 money-back guarantee No No NA No No NA No No NA No No NA	Mac Peak Systems, Inc.											Up to 256K bytes; 1M- or 4M- byte SIMM		warranty	\$795
(801) 485-8857 Switch II money-back guarantee grantee PC/XT Turbo IBM PC, PC XT NA Works with 4.77-9 50%-75% Flug-in Yes Optional No NA None Two-year, money-back money-back												bytes; 1M- or 4M-byte SIMM		warranty	Informatic not provid
Switch money-back		Switch II			te tes net		Tryal.					101	1/16	money-back guarantee	\$124.95
	HOSE THE BUILDING	Switch			Mark Street	Spor-3		15 15			1			money-back guarantee	\$149.95 \$399

¹Dynamic random-access memory ⁷Single in-line memory module

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

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T-1 PLANNING INTEGRATED CORPORATE NETWORKS

Dr. John McQuillan, President, McQuillan Consulting



This intensive, one-day seminar instructs you on planning issues for integrating packet, circuit, and channel switching; SNA and X.25; and voice and data in a corporate network strategy. You will address the role ISDN will play, as well as enterprise-wide networking and bandwidth-intensive applications.

Level: Intermediate

T-2 MULTIVENDOR/MULTIARCHITECTURE LANS: MAKING THEM WORK

Dr. Kenneth Thurber, President, Architecture Technology



Attend this tutorial for a comprehensive overview of today's LAN environments. Discussion will include how to tie diverse and often incompatible network elements together in a manageable, logical way, as well as alternatives to LANs. Level: Advanced.

T-3 ISDN: STANDARDS, PRODUCTS AND SERVICES

James G. Herman, Independent Consultant, and Mary Johnston, Senior Consultant, Telecommunications Consulting Group at BBN



ISDN is fast approaching. Some say with too little agreement on fundamental standards and applications. Attend this highly focused, intensive session to anticipate the emerging standards, vendor trials, conflicts, successes, products and service offerings that will emerge over the next several years.

Level: Intermediate.

T-4 MULTIVENDOR NETWORK MANAGEMENT Jerry McDowell, Vice President, Vanguard

Telecommunications Inc.



Enroll in this intensive tutorial for skills in how to manage a network which links multiple carriers and a variety of hardware and software vendors in one corporate network. You will learn how to take control into your own hands and avoid finger pointing, acrimony and poor service. Level: Intermediate.

T-5 HOW TO BECOME A BETTER TELECOMMUNICATIONS MANAGER

Gerald P. Ryan, President, Connections
Telecommunications Inc.



Today's network manager must not only understand new technologies and standards, but must also play many roles in the company. Attend this instructive tutorial for an entertaining and thought-provoking look at what you need to know to be a successful network manager, plus the tools, pro-

cesses, and organization that will maximize your efficiency. Level: Intermediate.

T-6 THE LATEST LOOK AT NETWORK STANDARDS AND OSI

Richard desJardins, Director of Technology R&D, Computer Technology Associates Inc.

As OSI and the older standards



As OSI and the older standards are reaching maturity, numerous new standards are in the works. Attend this intensive session for a look at the new generation of standards — including their purpose, significance, applications, and technical elements. Level: Introductory.

T-7 MODELING AND DESIGNING DATA AND INTEGRATED NETWORKS

Dr. Wushow Chou, Professor of Computer Science and Electrical and Computer Engineering, North Carolina State University



Enroll in this tutorial for detailed instructions on how to design integrated networks. You'll learn about combining voice and data on a single architecture to maximize the efficiencies of wideband services, the migration from classical multipoint to distributed systems, plus cost-efficiency issues and oth-

plus cost-efficiency issues and other practical considerations. Level: Advanced.

T-8 IBM NETVIEW: INDUSTRY WIDE

Atul Kapoor, Vice President, Kaptronix Inc.



This tutorial gives you a thorough and comprehensive introduction to IBM's NetView and NetView/PC—their operation, technical specs, dependencies and functional interactions, plus an analysis of their impact on the industry, significance for users, and practical suggestions for implementation.

Level: Intermediate.

T-9 OPEN NETWORK ARCHITECTURE: CARRIER/VENDOR/USER IMPLICATIONS

Haines Gaffner, President, LINK Resources Corp.



The FCC has ordered AT&T and the RBOCs to adopt ONA to stimulate competition in enhanced data processing services over public switched networks. Enroll in this tutorial to learn the details of the ruling, its implications for service offerings and an overview of who the players will be.

Level: Intermediate.

T-10 INTERNATIONAL NETWORKS: SOLVING THE PRACTICAL PROBLEMS

Len Elfenbein, President, Lynx Technologies Inc.



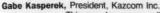
Attend this tutorial if your company is expanding its network outside the U.S. You'll receive immediately useful information on tariffs, rules, how to handle ordering and service delays, the role of the PTTs, how to deal with the lack of consistency from country to country, and many more issues you must confront to

succeed. Level: Intermediate.

cess network

year for telecommunications professionals

T-11 BUILDING THE NETWORK CONTROL CENTER





This one-day course will help you successfully operate a network control center on a day-to-day level. You will focus on the practical requirements, functions to be performed, systems and tools available and how to put them all together to gain control over your network. Level: Introductory.

T-12 REGULATORY ISSUES AND ANSWERS Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding



Take this comprehensive seminar to make sense of the increasingly complex regulatory environment. You will receive a thorough briefing on the legal, social, and regulatory issues, the evolution of vendor technology and industry stan-dards, and significant developments affecting the coming regula-

tory year. Level: Intermediate

T-13 INTRODUCTION TO DATA COMMUNICATIONS

Gary Audin, President, Delphi Inc.



This perennially popular tutorial provides exactly the right mix of concept, technology, and application for the beginner to get a good foundation in data communications. The course notes are excellent reference material and the instructor is one of the most highly regarded professionals in the in-

dustry. Level: Introductory

T-14 INTRODUCTION TO VOICE COMMUNICATIONS AND PBX

James Morgan, Principal, J.H. Morgan



Enroll in this full-day tutorial for a comprehensive foundation in the basics of voice communications technology, PBX characteristics, switched networks, tariffs and services, as well as an overview of traffic engineering. Level: Introduc-

T-15 IMPACT OF THE NEW POST-DIVESTITURE TARIFFS ON LARGE NETWORKS

Robert L. Ellis, President, The Aries Group



In this intensive tutorial you will learn the structure of the post-divestiture tariffs, the latest January 1988 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics in configuring data networks, the LATA-pure strategy

and federal access tariffs and how to use them Level: Intermediate

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- "Introduction to SNA"
- 'Introduction to Network Diagnostics
- and Control
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- 'Traffic Engineering'

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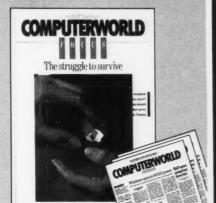
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SPOTLIGHT

COMPANY	PRODUCT	RUNS ON	MICROPROCESSOR	WORKS WITH/REPLACES MICROPROCESSOR CHIP	CLOCK SPEED (MHZ)	PERFORMANCE IMPROVEMENT	INSTALLATION METHOD	FULL SUPPORT FOR COPROCESSORS	INCLUDES NUMERIC COPROCESSOR	DEDICATED RANDOM-ACCESS MEMORY	AMOUNT AND TYPE OF DEDICATED RAM	SOFTWARE COMPATIBILITY LIMITS	WARRANTY OFFERED	PRICE
Microsoft Corp. (206) 882-4080	Mach 20 Performance Enhancement System	IBM PC and compatibles	80286	Replaces	8	100%-	Plugin	Yes	No and	512K	Up to 3.5M bytes	All soft- ware, including OS/2 compa	Two-year	\$495
Microspeed, Inc.	Fast 88	IBM PC, PC XT and	8088-2, V20	Replaces	7.4	60%	Clip-on	Yes	Optional	No	NA	None	One-year, part	\$129-\$149
(800) 232-7888 Microway (617) 746-7341	Past Cache 286	compatibles IBM PC, PC XT and	10286	Warha with	9,12	360%	Plug-in	Yes	Optional	No	NA	None	One-year, puri and labor	From \$349
(617) 746-7341	Super Cache 286	IBM PC, PC XT and	80286	Works with	12	500%	Plug-in	Yes	Optional	No	NA	None	One-year, part and labor	\$599
	Number	iBM PC, PC XT and	9086	Replaces	9.54, 12	350%	Phag-in	Yes	Options	Yes	1M byte for	None	One-year, part and labor	From \$599
	Smasher ECM 88 Turbo	competibles 8088-based PC, PC	V20	Replaces	7.4	100%	Plug-in	Yes	Optional	No	DOS NA	None	One-year, part and labor	From \$149
	287 Turbo Plus	IBM PC AT	80286	Works with	Up to 11.5	300%	Plug-in	Yes	Optional	No	NA TABLE	None	One-year, part	
	Monoputer	IBM PC XT, AT and compatibles	T-800	Works with	16	5,000%	Plug-in	Yes	Yes	Yes	2M bytes	None	One-year, parts and labor	\$1,995 (includes Occam compiler)
Monolithic Systems Corp (303) 790-7400	Microframe 386	IBM PC AT	80386	Replaces	16, 20	200%	Replaces mother-	Yes	Optional	Yes	Up to 8M bytes	None	One-year, part and labor	
Network Specialties, Inc. (415) 467-8411	Jump 020	Macintosh Plan, 512	68000	Works with		File	Clip-on	Yes	Optional	No	NA	-	120-day, full technical	\$999 (ms RAM)
Novy Systems, Inc.	Mac 20 MX	Macintosh 512E,	68020	-	12, 16, 20, 24		Plug-in, clip	Yes	-	Yes	1M, 4M bytes	None	Six month,	\$995-\$4,99
(904) 427-2358 Orchid Technology Co.	PC Turbo 286E-	SE, Plus IBM PC, PC XT,	80286		10	300%	On Plug-in	Yes	Optional	Yes	1M byte	KG	money-back Four-year	\$1,295
(415) 683-0300	Tiny Turbo 286	AT and compatibles IBM PC, PC XT and	80286	Works with	8, 12	450%-	Plug-in	Part of the last			39A	None	Four-year	8445-8645
Carlo Salarina	Jet386	compatibles IBM PC AT	80386	Works with	16	300%	Plug-ie		Optional	Yes	64K bytes		Four-year	\$1,299
Opus Systems, Inc. (408) 446-2110	Series 110 Personal Mainframe	IBM PC, PC XT, AT and compatibles	32032	Works with	10	400%	Plug-in	Yes	Yes	Yes	2M or 4M bytes, 256K- byte	None	90 days, parts and labor	\$1,995
	Series 220 Personal Mainframe	IBM PC AT or compatible	32332	Works with	15	800%	Plug-in	Yes	Yes	Yes	4M, 8M, 16M bytes, 1M-bit DRAM		90 days, parts and labor	\$3,995
	Series 340 Personal Mainframe	IBM PC AT or compatibles	Clipper	Works with	25	1,600%	Plug-in	Yes	Yes	Yes	4M, 8M, 16M bytes, 1M-bit DRAM		90 days, parts and labor	\$6,140
	Series 350 Personal Mainframe	IBM PC AT or compatibles	Clipper	Works with	30	2,000%	Plug-in	Yes	Yes	Yes	4M, 8M, 16M bytes, 1M-bit DRAM	None	90 days, parts and labor	\$7,640
PC Technologies, Inc. (800) 821-3086, (313) 996-9690 outside U.S.	286 Express	All 8088 based microcomputers	80286	Replaces	8, 12, 16	200%- 800% (depending on application)	Plug-in	Yes	Optional	NA	NA	None	Two-year, parts and labor	\$445-\$795
	RAM Racer	Any 8088 based microcomputers	80286	Replaces	8	200%- 600% (depending on	Plug-in	Yes	Optional	Yes	2M bytes ex- panded memory	None	Two-year, parts and labor	\$595
	386 Express	IBM PC AT	80386	Replaces	16	application) 200%- 300%	Plug-in	Yes	Optional	No	NA	None	Two-year,	\$1,195
Quadram Corp. (404) 923-6666	Super Sprint 286	8088 based IBM PC, PC XT or compatible	80286	Either	12	Up to 300%	Plug-in	Yes	Optional	No	NA	None	One-year	\$545
	Quadsprint	IBM PC, PC XT and compatibles	8086	Replaces	10	More than 100%	Plug-in	Yes	Optional	No	NA	None	One-year	\$345
	Super Sprint 286 Accelerator Board	IBM PC, PC XT and compatibles	80286	Replaces	4.77, 8, 10, 12		Plug-in	Yes	Optional	No	NA	None	One-year, limited	\$545
Rodius, Inc. (408) 434-1010	Radius Accelerator	Macintosh Plus, SE	68020		16	400%	Clip-on (Plus), Internal expansion port (SE)	Yes	-	No	NA	None	90 days	\$995
Sigma Designs, Inc. (415) 770-0100	Turbo Cache 286	IBM PC, PC XT and compatibles	80286	Replaces	10	Up to 1,000%	Plug-in	Yes	Optional	No	NA	None	One-year, part and labor	\$649
Total Systems Integration	TSI-020	Macintosh 512E, Plus, SE	68020	Works with	12, 16, 20, 24		Clip-on	Yes	Optional	Yes	1M, 4M byte	None	90 days, parts and labor	\$695 (12 MHz, no
(503) 345-7395							1000							RAM)

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vice-president of corporate marketing and information services Continued on page 10

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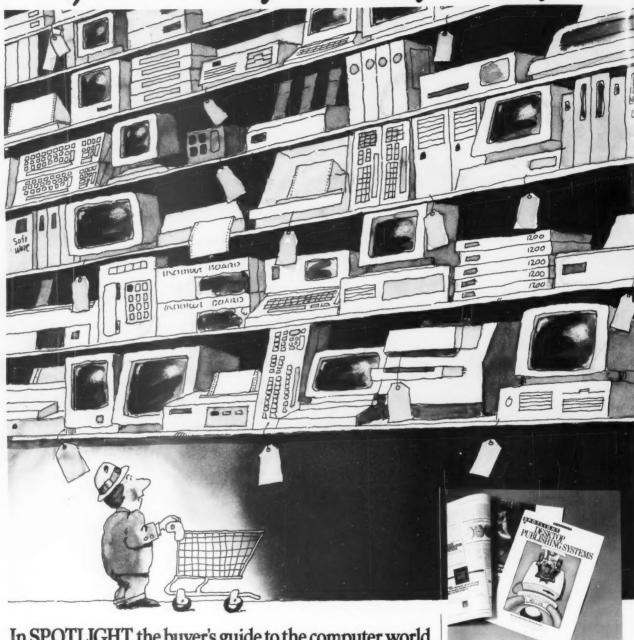
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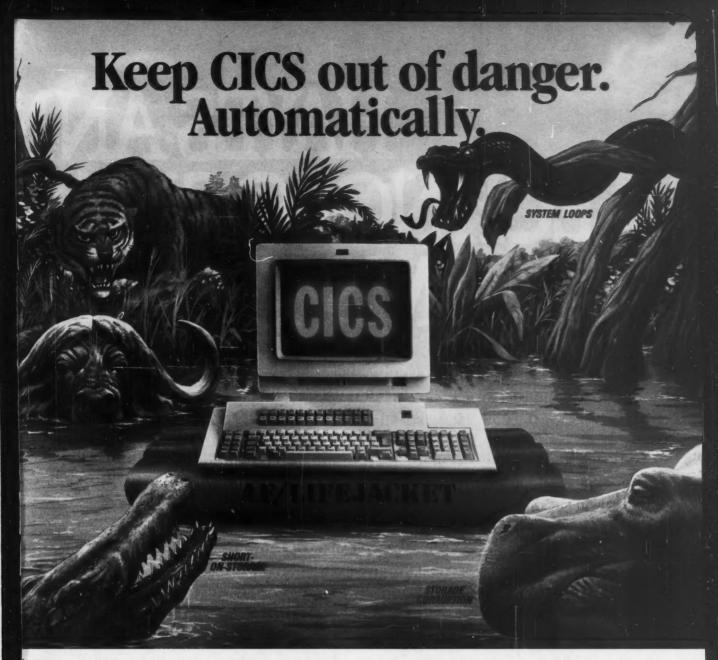
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Hayes



Bennett

CONTINUED FROM PAGE 105

advent of DB2 caused many user companies to defer purchase decisions until they had tested IBM's latest entry in the data base derby.

"We could have survived as an independent company, but we would not be as strong as we are today," Bennett says of the acquisition, one of the most significant moves by a regional Bell holding company into the computer business. "There is no way to fund a company when expenses are growing at 30% to 40% and revenue growth is only at 15% to 20%."

Bennett, a World War II air force pilot and graduate of the University of Virginia, joined ADR in 1966 as a manager of operations and marketing at the behest of a friend, Dick Jones, the firm's second president. At the time, ADR was a small professional services company that did programming and consulting for the government and large commercial users.

The company had already decided it wanted to be a systems software firm, but it needed a strong marketing push. To help get ADR quickly off the mark, Bennett used the sales and marketing experience he had gained at the former Burroughs Corp., then Sperry Corp.'s Univac division, and Collins Radio, now a telecommunications subsidiary of Rockwell International Corp. "My first job was to convince the world to buy software," he recalls. "The problem was that it was

hard to convice people to buy something that you couldn't see or own."

In 1970, Bennett replaced his friend Jones as president and chief executive officer. It was a landmark year for AD. The firm reached an out-of-court agreement with IBM on a suit it had filed charging that IBM's bundling of software with hardware resulted in unfair advantage. The agreement followed a similar U.D. Department of Justice decision and resulted in an undisclosed financial payment.

With those funds and proceeds from the sale of ADR's service bureau, time-sharing and turnkey systems businesses, Bennett was able to put the firm's financial house in order and focus the company on what it did best — systems software. The firm developed products like Librari-

an and acquired two companies, including Datacom, Inc., the firm that developed the kernel for its Datacom/DB DBMS.

Observers credit Bennett with transforming ADR from a small company obsessed with technology into a world-class competitor. "Like any company formed at that stage in the industry, ADR was founded by technically oriented entrepreneurs," Broadview's Goldstein says. "He brought professional management and organization to the company. Those skills were needed." Others, however, say Bennett was a smooth salesman who cultivated strong customer relations but did little of the strategic planning and management of the company.

Bennett says he feels that, with the backing of Ameritech and recent enhancements to Datacom/DB and Ideal, its applications development product [CW, Sept. 21], ADR is well positioned for the future. "The groundwork has been done," he says. "I don't feel I'm leaving any customers holding the bag."

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Martin

CONTINUED FROM PAGE 105

waiting to happen, but few, if any, U.S. companies are eager to pounce.

Although nearly every compatible maker is reportedly developing a PS/2 Micro Channel clone, they all are waiting for the other guy to make the first move. Nobody wants to incur the wrath of IBM, which has made it quite clear that it did not appreciate losing all that PC market share and that its new, highly proprietary boxes will be guarded as fiercely as the recipe for Coca-Cola.

Several of the offshore firms, little-known here but well-funded back home, are potentially strong enough to take a hit from IBM, if necessary. At any rate, a lawsuit from Goliath IBM is bound to be tied up in litigation for quite some time. Meanwhile, there's the chance to be first to market — always the name of the PC game — grab some headlines and increase market share in the country that counts. Why would a Compaq, which is cleaning up on the current DOS-standard micro environment that IBM made possible, want to take that risk?

Clearly, IBM will need a certain number of PS/2 compatibles out there to help perpetuate what it hopes will be the new microcomputing standard. Even IBM can't do that by itself. In the meantime, is it possible that companies such as Multitech and Mitac can establish a strong foothold in the PS/2 market to the detriment of overly cautious U.S. companies that waited too long on the sidelines?

These questions and more could easily be cleared up if IBM would outline precisely what its plans are as far as litigation and patent licensing are concerned.

IBM's silence is godlike, omnipotent and disturbing. It's also excellent competitive strategy. But in this era of huge trade deficits and increasing "Buy American" attitudes, U.S. companies need to make a collaborative effort to keep as much of the U.S. market to themselves as possible. If IBM inadvertently enables offshore companies to gain further inroads into the battered U.S. economy, its clever posture of silence could ultimately be met with a few angry voices.

Martin is a Computerworld West Coast correspondent.

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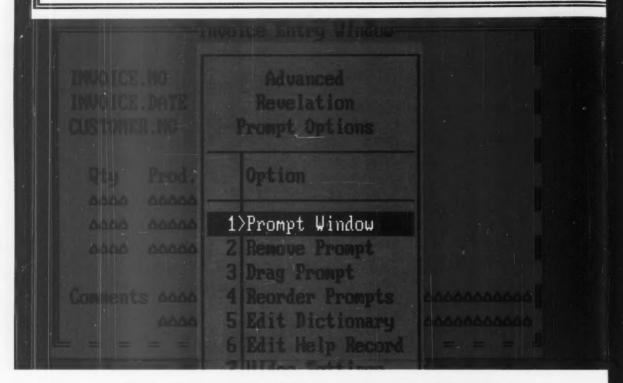
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COMPUTER CAREERS

EDI setting standard for future

Widespread use of document exchange bodes well for versatile MIS pros

BY PATRICIA TAYLOR



What do U.S. makers, auto the retail industry, transportation companies financial and

services firms have in common? They are all implementing versions of electronic data interchange (EDI) - a set of communications standards that allow business to be conducted electronically between companies over computer networks.

The promulgation of EDI and its acceptance by many leading corporations is creating a de-mand for MIS professionals trained in the data communications and business skills necessary to implement industry-spedocument exchange standards.

Crossing boundaries
Because EDI crosses all the boundaries of a business - requiring MIS support as well as cooperation from line managers it can become a very political issue. The task involves organizational challenges as well as technical ones, says consultant Victor Wheatman of Input, Inc. in Mountain View, Calif.

Much as the current wave of personal computer experts developed as more and more companies installed PCs, EDI experts are evolving as their companies turn to electronic invoicing, ordering and payment, Wheatman says. These experts are coming from both the information systems and end user ar-

The advantage these professionals possess is that since EDI is based on ANSI standards, their knowledge of the area will be transportable from one company to another, significantly enhancing their career opportuni-

Unlike other information systems standards, EDI is not part of the regular curricula that make up most MIS education programs. This lack of structured training means that the developing field is wide open to newcomers who can learn what they need to know by attending industry-specific seminars, of-fered by EDI standards organiza-tions like the Transportation Data Coordinating Committee in Washington, D.C.

Responsibilities

The EDI expert provides a workable solution for communication across systems using the universal EDI syntax, according to Bob Parks and Kent Feiler of Interchange Systems, Inc. in Chicago. To accomplish this task, an MIS professional must combine elements of his information systems background business organizational skille

Such an expert is charged

for the project, spokeswoman Carol King says.

These professionals included information systems staff as well as an outside consulting firm. The project proved so successful that First Chicago is now marketing its EDI software as a separate product. The staff, originally housed in one of the bank's operational areas, is now part of a separate division.

part of the automotive industry's effort to implement electronic document exchange. While less staff is required on the clerical side of the company, Kane's department implemented EDI using current staff members.

invoices over an EDI network as

Kane sees the need for EDI expertise as a short-term phenomenon. "It's relatively new, so understanding EDI standards is a plus for information systems professionals today," he says.

The mystery disappears

But once people develop sufficient overall communications and business knowledge, EDI standards by themselves will not oblige a company to hire an EDI expert, Kane says. "There is a not a whole lot of mystery to the standards," he adds. "A good analyst can understand them.

Another way MIS professionals can develop a career based on EDI is by going to work for a vendor of EDI products or becoming an independent consultant in the field. A number of companies, including McDonnell Douglas Corp, IBM and GE Information Services, a division of General Electric Co., offer products that conform to EDI stan-

According to a recent study by Input, the market for EDI software and services will grow from \$50 million this year to more than \$1 billion by 1990.

Taylor is an associate with the Center for the Study of Data Processing at Washington University in St. Louis.

N THREE TO FOUR YEARS, the EDI standards will be common knowledge. It will be like knowing Cobol."

> JOHN KANE ROCKWELL INTERNATIONAL CORP.

implementing software, which is developed using a format specific to EDI, to address business applications such as purchasing, accounts receivable and accounts payable.

The software programs usually run on existing computer systems. Although a basic understanding of communications technology and ANSI X.12 standards is necessary, the real challenge arises when integrating EDI into already existing application areas. An ideal candidate for an EDI-related position will possess both programming and business skills

The First National Bank of Chicago, which implemented EDI in November 1985, drew on professional talent from all the operating areas within the bank

EDI is the next logical step in data communications, Feiler and Parks say, and professionals who are well versed in the syntax will be able to compare themselves to business travelers who have mastered the English language vs. a less universal dialect.

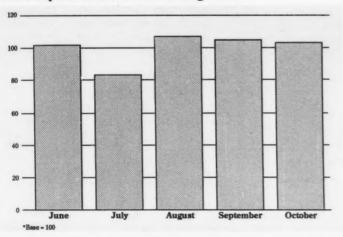
Coming attraction

'In three to four years, the EDI standards will be common knowledge," says John Kane, manager of administrative systems at Rockwell International Corp.'s automotive operations in Troy, Mich. "It will be like knowing Cobol, and it will be easier to find more and more people understand something about it."

Rockwell's automotive operation receives orders and sends

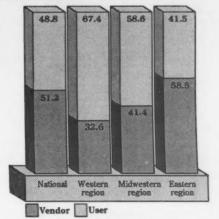
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"We filled 75% of the positions with responses from our first ad in Computerworld."



Biorn Nordemo Vice President Data Arts & Sciences, Inc. Weston, MA

jorn Nordemo is Vice President of Data Arts & Sciences, Inc. (DASI), a contract software agency based in Weston, MA. Although they place people in permanent positions, DASI most often places 'contract programming personnel' — consultants who fit special niches for short or long term commitments in corporations in the New England area.

"Our agency specializes in finding computer consultants — designers of systems, evaluators of hardware and software requirements, and computer programmers to mention a few. We recently were introduced to Computerworld as a potential source for finding these consultants, states Biorn. "I liked the idea because I know Computerworld has a broad reach — from MIS/DP directors to computer programmers, in multiple industries and multiple markets — and that's what DASI needs."

"We had four specific positions for MIS/DP consultants that we needed to till in northern New England. We used the local newspaper on a weekly basis, but people who are willing to move usually aren't reading the local Sunday paper. So, I felt this was a perfect opportunity to try Computerworld," says Bjorn.

According to Bjorn, he's quite satisfied with the results. "From Computerworld, we filled 75% (3 out of 4) of the positions with the responses from the first week, and the remaining position with the response from the following week. These results alone made my ads in Computerworld

And Bjorn also recognizes a second benefit to advertising in Computerworld. "The beauty of using Computerworld is that it's read by people in the computer industry who have a need for consultants, as well as being read by consultants who need to keep up to date on the marketplace," says Bjorn. "So we not only reach qualified candidates to fill our current openings, but we are creating awareness of the services that DASI has to offer," says Bjorn.

"We have some great plans for expansion and as we do, Computerworld is going to play a strong hand in helping us accomplish our goals." concludes Biorn.

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Roger Fraumann Staff Director Lachman Associates Inc. Westmont, IL

oger Fraumann is Staff Director for Lachman Associates, Inc. (LAI) of Westmont, Illinois. It is one of the largest privately held computer systems software consulting and development firms in the United States. And Roger is pleased to report that plans call for continuing the 50% annual growth every year for the next five years.

Roger is also pleased with Computerworld's contributions to the company's growth. When he needs qualified people to fill positions as the company grows, he turns to Computerworld.

"Computerworld is the only national publication that we routinely advertise in," says Roger. "Last year we determined that we needed consistent national exposure. We chose Computerworld, which gave us exactly that. Simply put, Computerworld delivers just what we're looking for: top-quality job applicants."

"We get about 20 responses per ad, and what really counts is that those responses yield at least two quality applicants per ad," Roger explains. "Overall, a higher percentage of quality people respond to our ads in Computerworld, as opposed to what other publications deliver. Computerworld works for us."

Plus, Roger has found added incentive to advertise in Computerworld: "The same ad that runs nationally in Computerworld costs twice as much to run in the Chicago Tribune, a local newspaper," he notes.

Since LAI began advertising in Computerworld, the company has gone from 50 to 130 full-time professionals. "We've been in Computerworld about every other week. And with the company's plans for growth for the next five years, we're going to continue advertising in Computerworld," says Roger.

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InfoWorld is the weekly newspaper edited for personal computer professionals at organizations using multiple systems. It has a total audience (subscribers and pass-along readers) of 420,000, including PC manager software developers and other oriented professionals.

Network World is the news and features weekly for larger users of communications and networking. Its 220,000 readers (including subscribers and pass-along readers) include voice and data communications man-agers and specialists as well as com-

Digital News is a biweekly newspaper for computer professionals who work with the VAX line of computers from Digital Equipment Corporation. Total readership, including subscribers and pass-along readers, is over 210,000, including computer executives and managers, systems analysts, pro-grammers, engineering executives and staff, and other VAX-oriented computer professionals

Federal Computer Week is edited for federal government. Its weekly circula-tion includes MIS executives and managers, as well as systems analysts. programmers, software developers, communications specialists and other information systems professionals.

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\$ 1.25 difference

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\$ 9.29 InfoWorld 5.00 Network World \$14.29 Total - 1.43 less 10% \$12.86 discounted rate Computer Currents/Northern California Edition is published biweekly and has a total circulation of 75,000. Total readership exceeds 225,000 Computer Currents/Southern California Edition is published monthly and has a total circulation of 78,000, with a total readership of 234,000.

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To put the IDG Communications Computer Careers Network to work for you, call the sales office nearest you — or contact John Corrigan, Recruitment Advertising Sales Director, at 617-879-0700. Just one quick phone call can give you all the information you need on running your recruitment advertising — regionally or nationally — in up to eight leading industry newspapers.

SYSTEMS ENGINEER

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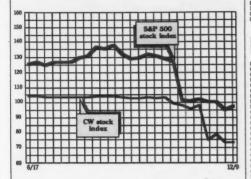
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	Portables/Laptops	March 28
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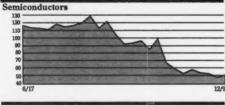


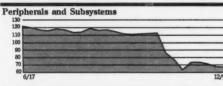
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Peripherals & Subsystems	68.2	67.7
Leasing Companies	83.6	79.8
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S&P 500 Index	95.2	97.4











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	Computer Systems									
)	ALLIANT COMPUTER SYS	37	5	6.00	0.00	0.00				
5	ALPHA MICROSYSTEMS	6	3	3.00	-0.13	-4.00				
,	ALTOS COMPUTER SYS	17	9	9.00	-0.75	-7.69				
i	AMDAHL CORP	50	19	30.50	2.63	9.42				
)	APOLLO COMPUTER INC	25	9	11.50	0.50	4.55				
)	APPLE COMPUTER INC	60	20	35.00	2.50	7.69				
ì	BOLT BERANEK & NEWMAN	30	12	13.63	-0.88	-6.03				
)	BRITTON LEE INC	5	1	1.38	-0.13	-8.33				
ì	COMPAQ COMPUTER CORP	79	19	47.25	3.75	8.62				
)	COMPUTER AUTOMATION INC	17	3	6.25	-0.50	-7.41				
	COMPUTER CONSOLES INC	12	2	3.38	0.25	8.00				
1	CONCURRENT COMP CORP	24		15.50	-0.50	-3.13				
ì	CONTROL DATA CORP DEL	38	18	19.50	-2.50	-11.36				
)	CONVERGENT TECH	12	3	3.50	0.50	16.67				
)	CONVEX COMPUTER CORP	22	6	7.00	0.25	3.70				
1	CRAY RESH INC	136	47	67.00	1.38	2.10				
5	DAISY SYS CORP	13	5	6.00	-0.25	-4.00				
ı	DATA GEN CORP	39	16	20.88	0.50	2.45				
ı	DATAPOINT CORP	9	3	4.63	-0.13	-2.63				
ŧ.	DIGITAL EQUIP CORP	200	105	125.38	4.38	3.62				
•	FLOATING POINT SYS INC	17	3	3.13	-0.13	-3.85				
•	GOULD INC	34	8	10.50	-0.50	-4.55				
V	HARRIS CORP	43	22	24.88	0.50	2.05				
N	HEWLETT PACKARD CO	74		52.75	5.13	10.76				
N	HONEYWELLING	91	49	53.00	-2.25	-4.07				
ŧ	IBM	176	102	114.00	3.50	3.17				
3	INFORMATION INTL INC	17	9	9.88	0.13	1.28				
Š.	IPL SYS INC	3	2	1.88	-0.50	-21.05				
2000	MASS COMPUTER CORP	14	5	5.00	-0.13	-2.44				
	MATSUSHITA ELEC INDL LTD	196		162.50	1.50	0.93				
3	MEGADATA CORP	7		2.88	-0.38	-11.54				
ě	MENTOR GRAPHICS CORP	39	14	18.75	1.75	10.29				
Ñ	NBI INC	14	4	4.13	0.25	6.45				
N	NCR CORP	87	44	60.25	-3.25	-5.12				
N	PRIME COMPUTER INC	31	12	13.88	0.38	2.78				
COCON	PYRAMID TECHNOLOGY	12	4	6.25	0.25	4.17				
ă	STRATUS COMPUTER	41		20.63	1.63	8.55				
ž	SUN MICROSYSTEM INC	46		29.75	0.00	8.68				
3	SYMBOLICS INC	38		1.19	1.88	8.38				
	TANDEM COMPUTERS INC	57				8.38				
4	TANDY CORP	5/	28	31.88	1.00	3.24				

Software	&	DP	Services

ZOZOOOZOZ	ADVANCED COMPTECH ADVANCED SYS INC AGS COMPUTERS INC AMERICAN MGMT SYS INC AMERICAN MGMT SYS INC AMERICAN SOFTWARE INC ANACOMPINE ANACOMPINE ASK COMPUTER SYS INC AUTODESK INC AUTODESK INC AUTODESK INC AUTODESK INC COMPUTER SYS INC OMPUTER SYS INC COMPUTER SYS INC OMPUTER SYS INC	17 34 55 12 37	4 13 6 12 16 5 13	4, i 3 26.50 13.38 9.88 7.50 6.25 18.00 6.88 21.25 42.63 6.75 26.38	0.63 -0.50 -0.13 -0.75 -0.38 0.38 0.00 1.38 -0.63 3.50 2.88 0.00 2.00	17.86 -1.85 -0.93 -7.06 -4.76 7.32 0.00 8.27 -8.33 19.72 7.23 0.00 8.21
Q	COMPUTER HORIZONS CORP COMPUTER SCIENCES CORP	15	7	7.13 48.50	-1.50 2.75	6.01
N	COMPLITER TASK GROUPING	18	9	9.75	-1.00	-9.30
Q	COMSHARE INC	28	12	13.00	0.00	0.00
Ñ	COMSHARE INC CULLINET SOFTWARE INC CYCARE SYS INC	14	6	4.75 6.00	-0.50 -0.13	-9.52 -2.04
Q	CYCARE SYS INC DUQUESNE SYS INC DATA ARCHITECTS, INC.	33	10	16.00	0.50	3.23
Ä	DATA ARCHITECTS, INC.	17	7	7.50	-0.38	4.76
N	GENERAL MTRS (CLS F)	51	24	32.88	-0.63	-1.87
Q	HOGAN SYS INC INFORMIX CORP INTELLICORP INC KEANE INC LOTUS DEV CORP MANAGEMENT SCI AMER MICRO PRO INTL CORP	17	5	5.13	-0.38	-6.82
200000000000	INFORMIX CORP	31	10	17.75	-0.75	-4.05
Q	INTELLICORPING	11	3	3.25	0.00	0.00
ð	KEANE INC	40	16	6.25 26.50	0.00	9.28
×	MANAGEMENT SCI AMED	21	6	6.38	-0.13	-1.92
X	MICRO PRO INTL CORP	8	2	3.31	-0.50	-13.11
ŏ			23	46.25	2.25	5.11
õ	NATIONAL DATA CORP	34	19	23.00	1.50	6.98
Q	NATIONAL DATA CORP ON LINE SOFTWARE INTL INC ORACLE SYS CORP	22	9	9.88	0.00	0.00
Q	ORACLE SYS CORP	38	9	24.75	3.63	17.16
N	PANSOPHIC SYS INC POLICY MGMT SYS CORP	28 30	15	13.13 17.50	-0.13	-0.94
X	PROGRAMMING & SYS INC	14	7	7.25	-0.38	-4.92
č	REYNOLDS & REYNOLDS CO		14	13.75	-2.00	-12.70
õ	SELCORP	18	9	14.75	1.00	7.27
Q	SHARED MED SYS CORP	53	19	19.88	-1.13	-5.36
Q	SOFTWARE AG SYSTEMS INC	19	9	9.25	-0.13	-1.33
Q	SOFTWARE PUBG CORP	17	5	6.88 7.25	0.25	3.77
ZOOPOOOOOO	STERLING SOFTWARE INC	14	10	10.00	-0.50	0.00
à	SUNGARD DATA SYS INC	30	17	22.50	1.00	4.65
2	SVS SOFTING	24	7	9	0.25	2.86
0	STERLING SOFTWARE INC SUNGARD DATA SYS INC SYSTEMATICS INC SYS. SOFT INC. VM SOFTWARE INC	45	7	7.00	-0.50	-6.67

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*ZZOOOZZZ	ADV MICRO DEVICES INC ANALOGIC CORP INTEL CORP INTEL CORP LSI LOGIC CORP MOTOROLA INC NATL SEMICONDUCTOR TEXAS INSTRS INC WESTERN DIGITAL CORP	25 24 13 42 17 74 22 80 33	8 8 5 14 7 35 10 36 12	9.13 10.25 6.38 25.50 7.75 46.38 12.38 46.00 13.13	0.50 0.63 0.38 3.00 0.75 4.25 0.88 4.13 0.00	5.80 6.49 6.25 13.33 10.71 10.09 7.61 9.85 0.00		
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Many blue chippers rebound nicely; Unisys, Wang stay flat

Last week's overall market surge meant handsome gains for previously battered computer stocks, despite a late sell-off in Thursday's trading session.

Most of investors' high-tech favorites responded well. IBM was up 3¼ points to 111, while Digital Equipment Corp. surged 9 points to 122%. Compaq Computer Corp. rose 5¾ points to 46½, Hewlett-Packard Co. gained 6 points to 51¼ and Apple Computer, Inc. was up 4 points to 34¾. In the micro arena, Microsoft Corp. vaulted 5½ points to 47½, Ashton-Tate Corp. added 2½ points to 18¼ and Lotus Development Corp. rose 2¼ points to 25½.

Not all major systems vendors joined in the rally. Unisys Corp. gained only % of a point to 29%, and Wang Laboratories, Inc. lost % of a point to 9%.

Takeover target Telex Corp. rocketed 10¼ points to 52, thanks to a higher tender offer from Memorex International N.V. that sent the stock up 9¼ points in Tuesday's trading. Western Digital Corp. bought Tandon Corp.'s Winchester disk drive business and rose 1½ points to 13½, but Tandon remained unchanged at 1¾.

CLINTON WILDER

Sun needs prep time for OS

BY JULIE PITTA

MOUNTAIN VIEW, Calif. Sun Microsystems, Inc. users are eagerly awaiting a new operating system for the Sun-3 and Sun-4 workstations, a version promised to some customers by year's end.

According to John Hime, Sun's hardware marketing director, SunOS Version 4.0 will not be available to users for another seven to eight months.

Hime said Sun had told selected customers of SunOS 4.0's pending release. However, Sun developers have discovered that "there's a lot more work to get these new features into the OS." he added.

'Nudging' Sun

Sun received some gentle criticism from customers at a gathering last week of Sun users in San Jose, Calif. "It's been more like nudging," said R. Miles Waugh, manager of the computer applications division for Philip Morris U.S.A. "It's not gotten to the point where people are saying will switch vendors There's a lot of loyalty for Sun out there.

John Kinyon, engineering group leader for Motorola, Inc.'s Cellular Group, said criticism may stem more from a desire to have the latest whiz-bang capabilities than from a need.

"I've got enough to keep me busy right now," Kinyon said. "I suspect we will have Version 4.0 up and running before a lot of applications will be ready. But, like everyone else, we can't wait.

Specifics lacking Sun's Hime declined to offer specifics on the new operating system, saying that it has not been formally announced. Since Nov. 30. SunOS 3.2 has been available on the Sun-4 workstation, which shipping in recent began months. No beta-test versions of SunOS 4.0 have been shipped, Hime added.

Rich Edwards, an industry analyst for Robertson, Colman & Stephens, said SunOS Version 4.0 will offer "the first convergence" with AT&T's Unix System V, Release 3.

Users said they are impatient to get their hands on the new operating system.

"I'm always anxious to get the latest and greatest operating system," said Jim Forger, a systems engineer for Eastman Kodak Co. "But if it's not out by the spring, I'll start running into problems.

Dexpo vendors mad as wet hens

Some exhibitors chafe after being put in outdoor rain-soaked tent

BY JAMES A. MARTIN

ANAHEIM, Calif. -Several third-party Digital Equipment Corp.-compatible vendors were surprised and angered last week to find that their Dexpo West '87 booth space was not located on a conventional trade show floor but inside a rain-soaked tent in a parking lot.

We were told our space would be in Hall B, a temporary structure, and of course we as sumed that meant some kind of climate-controlled building, said a Convex Computer Corp. spokesman who asked not to be

Of those exhibitors inter-

viewed, none reported actual computer equipment damage, but they did not rule out the pos-

"Our C1 XP super minicomputer is an expensive piece of equipment to be running on water in a parking lot," the Convex spokesman said.

Cloudburst

A rainstorm swept through Southern California Dec. 4 and 5, just before and at times during some 200 exhibitors' efforts to set up for Dexpo in makeshift exhibition space outside the Dis-neyland Hotel here. The tent structures housed more than two-thirds of all the Dexpo ex-

The waterlogged situation was apparently aggravated later by cleanup crews, whose efforts to sweep away standing rooftop rainwater actually caused more water to seep onto the show

Because of the rains and leaking rooftop, some exhibitors said the costs of convention setup were doubled.

"Normal setup costs are around \$5,000 to \$6,000, but with the expense of drying our booth out, protecting it from the rain, the labor in moving our computer equipment and the unexpected costs of a hotel suite, it will cost us around \$10,000 to \$12,000," said Lynn Neff, manager of trade shows for Informix

Software, Inc.
New exhibitors this year claimed they did not know their booth space would be in a tent. Steven Barth, vice-president of marketing for Dexpo organizer Expoconsul International, Inc., said there had been some misunderstandings about Expoconsul's description of the booth space as a "semirigid temporary structure."

"Technically, it's not a tent, and we didn't call it one. But a lot of people didn't know what it would be because of that description," Barth said.

Next year's Dexpo West will also be held in Anaheim and will again require a temporary structure to house exhibits, Barth said. Plans have already been made to contract for the same tent structure again next year, but modifications will be made to ensure that this year's problems are not repeated.

Ada's commercial course accelerates with intros

BY ROSEMARY HAMILTON

BOSTON - The Ada programming language took some small steps into the commercial market last week with the help of a few announcements from mainstream vendors at Ada Expo'87. a conference and trade show held here.

Two data base management vendors, including Oracle Corp., announced interfaces to the Ada environment. At least two vendors, including Alsys, Inc., intro-duced Ada products for Apple Computer, Inc.'s Macintosh and said they would target the offerings at commercial customers.

Ada's move into the commercial arena has long been expected by some observers, but it has vet to meet some users' expecta-

Christened as the standard programming language by the U.S. Department of Defense, Ada has apparently proliferated in certain overseas markets, including Europe. Ada won a new lease on life when the DOD reemphasized its commitment to the language earlier this year.

"We have been expecting it to spread in the [U.S.] commercial market, but there was little indication of it there," said consultant Kenneth Bosomworth at the Ada Expo show.

Bosomworth, president of International Research Development in Norwalk, Conn., said his firm has been tracking Ada's growth in Europe. He summed up Ada's presence in the U.S. commercial market by saying, 'It just isn't happening here.

Edward Berard, an Ada advocate who served on the Executive Committee of Ada Expo. said he remains confident that the language will be accepted one day by traditional data pro-

cessing shops.
"There's no doubt it will be a

gradual introduction" to DP shops, said Berard, who is president of EVB Software Engineering, Inc. in Frederick, Md. "But it is making small inroads."

Announcements made last week at the show included the following:

 Oracle released Pro Ada, a program that reportedly allows users to embed SQL statements into programs written in Ada. With the SQL statements, the Ada programs can access the Oracle relational data base management system. Pro Ada will run on Digital Equipment Corp. hardware. It requires DEC's Ada compiler and Version 5.1 of the Oracle DBMS.

 Computer Corporation America said it is shipping an interface that links the Ada envitional DBMS. The interface will allow Ada programs to directly access and retrieve data. It is set to be available in January as a free feature of Model 204.

· Rational, a Mountain View. Calif.-based company that makes an Ada development system, announced it will jointly market its product with IBM for IBM's 4381 and 9370 platforms.

Lotus sues ad firm over trade secrets

Microsoft blows whistle on alleged offer

CAMBRIDGE, Mass. - Lotus Development Corp. filed suit against a Boston advertising agency Friday, alleging that the firm offered "to sell Lotus's trade secrets and confidential information" to Lotus rival Microsoft Corp.

According to Lotus, the Boston-based advertising agency Rossin Greenberg Seronick and Hill, Inc. attempted to get the Microsoft advertising account by offering confidential Lotus information. But instead of using the information against Lotus, Microsoft gave copies of an incriminating letter and an explanatory brochure to Lotus.

'Intimately acquainted'

In the brochure sent to Microsoft's director of corporate communications, the agency allegedly wrote, "The reason we know so much about Lotus is that some of our newest employees just spent the past year and a half working on the Lotus business at another agency.

"So they are intimately acquainted with Lotus's thoughts about Microsoft," the brochure continued.

Lotus also named James Mambro and Jay Williams in the suit. Both are former employees of Lotus's advertising agency, Leonard Monahan Saabye in Providence, R.I., who now work for Rossin.

Rossin officials were unavailable for comment at press time.

Lotus sought injunctive relief and unspecified damages.

Rodime settles one 31/2-in. drive suit

BY CLINTON WILDER
CW STAFF

GLENROTHES. Scotland The backlog of lawsuits lodged by Rodime PLC against various manufacturers involving 31/2-in. disk drive technology patents was reduced by one last week. Rodime and market leader Miniscribe Corp. reached an out-ofcourt settlement in a lawsuit filed by Rodime.

Rodime's suits against IBM and Conner Peripherals are still pending. In each of the three actions. Rodime has claimed that it developed the 31/2-in. drive technology and that other vendors using it must license the technology from Rodime ICW. March 2. March 30. June 221. Rodime also mailed written warnings to approximately 20 other vendors serting similar claims.

Longmont, Colo.-based Miniscribe agreed to pay Rodime for a license, which includes a crosslicense under each of the company's existing patents. Both companies refused to disclose specifically what technology Rodime will be licensing. The firms will continue to compete in the

31/2-in. drive market.

Although the amount of pay ment was not disclosed, disk drive industry analyst James Porter speculated that it may be very small.

"This suit has had very low credibility in the industry, Porter, president of Disk/Trend, Inc., a research and consulting firm in Mountain View, Calif. 'Rodime is essentially claiming a patent on making a disk drive smaller. This [settlement] sounds to me like an attempt by both companies to cut down their legal bills."

CONTINUED FROM PAGE 1

DEC-compatible third-party trade show held here last week.

The new VAX system's increased performance will come from a combination of software and symmetrical multiple processing, which is the ability to assign one application to each of several processors. No pricing details were given, and Demmer would say only that the next VAX 8000 system would be re leased before the end of DEC's 1988 fiscal year in June.

VAX crystal ball

Although Demmer did not elaborate on Polar Star, he did sketch out DEC's intentions for the VAX family and VMS operating system during the rest of the 1980s and early 1990s.

For example, Demmer said, DEC is developing a distributed systems architecture to be implemented by the early 1990s that will support a multivendor environment and feature the International Standards Organization's Open Systems Interconnect (OSI) networking standard as a major component. OSI will be incorporated at the operating system level, Demmer said. This will enable DEC systems to offer simplified interfaces to other operating systems, including Microsoft Corp.'s MS-DOS and OS/ 2 and AT&T's Unix System V.

Demmer said DEC's VMS op-erating system will be "only one element of the future distributed systems architecture we are attempting to define.'

He said the biggest change in the works for the VAX environment is increasing the current 32-bit memory addressing limitations. By the early 1990s, DEC hopes to go beyond the VAX's 32-bit ceiling with an expanded systems architecture.

Demmer would not say exactly how the expansion would be achieved. He said DEC currently has two reduced instruction set computing (RISC) projects moving through research and devel-opment. "We're not at the point where RISC will provide any-thing better than VAX, but we are exploring opportunities to get above memory and address

limitations of the 32-bit structure," he said.

Demmer added that "the VAX architecture can go into the next century, but whether it will be DEC's premier architecture is not certain."

In the meantime, DEC is experimenting with vector pro-cessing capabilities. "We have a 64-processor Microvax running on a single bus, but the real question is. What applications will lend themselves to parallel prossing?" Demmer said.

He said there were no imme diate plans for vector or parallel processing abilities but added that DEC believes the potential is so enormous that we are spending a lot of R&D dollars on it until it becomes a reality in the

Lukewarm reception

Users interviewed at the Dexpo show expressed only modest interest in Polar Star.

"I guess it's a good idea for DEC to offer something like a mainframe if they want to get IBM's customers, but most of us bought DEC because the departmental system is what worked best," said the director of computing for a California hospital, who asked not to be identified.

Leonard Herzmark, public health engineer for the Maricona County Department of Health in Phoenix, said that although a mainframe system would not be of interest to his particular department, it would be to the county hospital as a whole.

The question arises of would we stay with a departmental system or go with distributed computing by departments. would probably stay away from mainframes, although other areas within our organization need to move to larger and larger equipment." Herzmark said.

The concept of multivendor connectivity through the DEC operating system was especially appealing to users.

"If we could access other systems through the operating system and not have to add all sorts of networks and software, it would certainly make things easier," Herzmark said. "Every time you add more software, it adds more time, and you lose flexibility.

DEC dangles key to VAXBI lock

ill it or won't it open the VAXBI? Only DEC knows for sure. With the answer to that ques tion still uncertain, Digital Equipment Corp.'s proprietary VAXBI bus was the main topic of discussion during Dexpo West '87 and the Digital Equipment Corp. Users Society users group meetings held concurrently here last weel

Users also prodded DEC to improve its abilities to manage clusters and to connect to non-**DEC** machines

The VAXBI bus, used in the VAX 8000 series, is the only DEC bus not generally available for third-party development. DEC chooses which third-party products are sold for the

Some users said last week they would not consider a VAX 8000 series model because of the limits imposed by DEC. Others, however, said they believed DEC would eventually feel enough pressure from users and third-party vendors to license its VAXBI bus more freely.

There have been a lot of comments about the BI bus this week, but I'm not really worried about it, because I think DEC will change its stance in the not-too-distant future," said Robert Byers, director of computing services for

Jackson Community College in Jackson, Mich. Opening up the VAXBI bus to outside development is an ongoing discussion at DEC, but the company has no definite plans to change its policies, according to Bill Demmer, vice-president of DEC's Mid-Range Systems Business Group

While some users said they did not want to be

dependent on DEC alone, others said they had little faith in third-party developers offering worthwhile alternatives.

"When there's a problem with a third-party peripheral on DEC [hardware], you sometimes don't get much sympathy from either side," said William Bergstrom, a programmer/analyst for the U.S. Air Force in Tucson, Ariz. "The support from the third party is not always very good, and DEC is not very forgiving when you've bought a competitor's product instead of

Clusters and compatibility

One user said he would like to see DEC provide a way to manage a Vaxcluster from one station in a future VMS release.

'The way it is now, we have to set up each of our VAX 8600s so they can talk to each other. Each machine uses its own systems parameters and is booted differently, and you have to make sure they don't conflict with each other," said John L. Meler, a computer scientist with Computer Sciences Corp. in San Diego.

'VMS needs more of a cluster concept," Meler added.

Better compatibility with non-VAX systems, especially the Apple Computer, Inc. Macintosh, also on users' Christmas lists.

One user said he would like to see DEC and Apple join together in a joint development project that would benefit those customers who use both companies' systems.

While DEC and Apple management feel pretty good about each other, there is no specific activity for a joint development between the two at this time," Demmer said.

IAMES A. MARTIN

Real-time offerings get another boost

MARLBORO, Mass. - Digital Equipment Corp. last week extended its real-time computing capabilities by enhancing VaxELN software and packaging the 3-month-old Vaxstation 3500 with its Vax-

lab offerings. VaxELN Version 3.0 supports three new runtime systems - the Microvax 3500, the Microvax 3600 and the VAX 8800 - and includes new tools for development and runtime environments.

DEC enhanced the Vaxlah Data Acquisition and Analysis systems to include support for DEC Q-bus-based Microvax systems. The vendor said device-dependent real-time applications can be migrated between Q-bus- and DEC VAXBI-based configurations with little or no reprogramming

Enhancements to DEC's Vaxlab Scientific Workstation family include support for seri-al I/O and an IEEE 488 bus and a Q-bus analog-to-digital converter, the 32-channel ADQ32 with data acquisition speeds of up to 200 KHz.

The base price for a Vaxlab/ Vaxstation 3500 is \$62,000. Base prices for VaxELN Version 3.0 software, including tool kit and runtime licenses. range from \$1,470 for a Vaxstation 2000 Toolkit and a Microvax II Runtime system to \$14,600 for a Vaxstation 2000 Toolkit and a VAX 8800 Runtime system.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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Feds require PCs for disabled

WASHINGTON, D.C. - Guidelines to ensure that federal employees with disabilities can use personal computers and other office automation equipment were announced last week by the U.S. General Services Adminis tration (GSA).

The guidelines, developed by the GSA and the U.S. Department of Education, are intended for use by managers at federal agencies and to show vendors what features the government will require in future contracts.

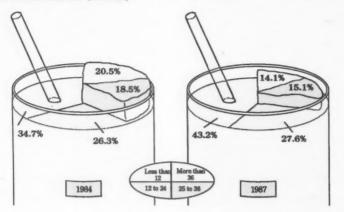
The guidelines call for largeprint displays for users with poor vision and cursors with an adjustable "blink rate" to accommodate workers with seizure disorders who may be sensitive to certain frequencies of flashing light. With the increasing importance of screen graphics, the document said, the government eventually will require that screen information can be extracted, interpreted and presented in speech or tactile form"

TRENDS

Application backlogs

Application backlogs melting slowly at IBM OS mainframe sites

PERCENT OF SITES BY BACKLOG (IN MONTHS)



n a survey of top data processing managers, Focus Research, Inc. found that the application backlog has shrunk at many large mainframe sites during the last three years and is greater than 36 months at only 14.1% of the sites, compared with 20.5% three years ago.

The same held true for DOS sites, which tend to have less sophisticated users and are equipped with smaller mainframes than shops running

IBM's MVS.

In DOS shops, 7.1% reported a backlog of more than 36 months, compared with 15.2% three years ago. Almost 60% said their backlog is less than 12 months, compared with only 47.2% in 1984.

Focus spokesman John Cook could not pinpoint why the backlog is shrinking, but conversations with DP directors suggested two reasons: the practice of buying applications commercially and the fact that the use of development tools, such as fourthgeneration languages, is more widespread.

In a related portion of the survev. the West Hartford. Conn... market researchers found that CASE tools are most prevalent in the sites with the largest backlogs, which would seem to indicate that advanced development tools do little to ease the backlog. However, Cook pointed out that CASE tools tend to be in use at the most sophisticated shops.

"The OS shops are more willing to try out new technology. Because they already have the biggest backlog, they are trying out the tools," Cook noted.

CHARLES BABCOCK

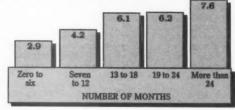
DOS sites see similar improvements

PERCENT OF SITES BY BACKLOG (IN MONTHS)



CASE tools favored in backlogged shops

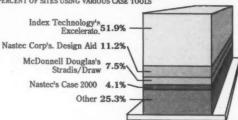
PERCENT OF SITES USING CASE* BY BACKLOG



*Computer-aided software engineering

Excelerator is top CASE draw





INFORMATION PROVIDED BY FOCUS RESEARCH SYSTEMS, INC.
CW CHARTS: AMY J. SWANSON

S E

"Psast! Hey, buddy, wanna buy some MIPS?" IBM makes no secret of its dislike for the measure known as MIPS - millions of instructions per second - particularly when someone wants to rate newly announced CPUs. Company officials have even resorted to the old saw about Meaningless Indicators of Performance. But last week an IBM researcher addressing the Computer Measurement Group conference in Orlando, Fla., freely quoted MIPS ratings for IBM systems. He offered a caveat about MIPS being only a measure of relative performance for ideal conditions that do not consider factors outside the CPU. Then he rated the IBM 9370 Model 60 at 1 MIPS, the 3090 Model 180 at 15, the 3083 Model JX at 8.5, the 3083 Model B at 7 and the 3033 Model Nat 4.5.

Avast, ye swabbies! ADAPSO is lobbying the U.S. government to reopen its Section 301 trade case against South Korea regarding software piracy. The investigation was suspended last year when Korea promised to protect soft-ware rights, but ADAPSO says the Korean government has failed to publish the necessary regulations and has failed to stop the sales of pirated software manuals.

Rushing into print. Unisys and printer manufacturer Delphax Systems are expected to announce an OEM deal today under which Unisys will sell Delphax's S6000-2 ion printer as the Unisys B9275 for use with Unisys A and V series systems. Delphax, which claims the three-year contract may be worth \$50 million, said the B9275 will be rated at 75 page/min.

Hospitalized. Former Rolm President Dennis Paboojian, 46, remains in critical condition at the Torrance (Calif.) Memorial Hospital as a result of a private plane accident that occurred Nov. 29. Paboojian and his flight instructor were returning from San Diego after a Thanksgiving visit with Paboojian's son. A Torrance Memorial Hospital spokeswoman said Paboojian, now a Rolm telecommunications consultant at the firm's Santa Clara, Calif., site, has suffered third-degree burns over 50% of his body. The spokeswoman said Paboojian slips in and out of consciousness. The flight instructor died in the crash.

Hot potato. Execucom Systems, a developer of financial planning and decision-support software, is on the auction block for the third time in three years. Travelers/Diebold Technology, which acquired Execucom in May 1986, is believed to be close to disposing of the Austin, Texas, software company. Twelve-year-old Execucom, which reportedly has revenue in excess of \$20 million, was once considered the highflier of the financial planning software business; that is, until Lotus caught the IBM PC wave. The firm was acquired for \$18 million in stock in 1984 by Continental Telecom, then sold to Travelers/Diebold.

Shooting for the stars. Despite not having formally announced its product, Stellar Computer in Newton, Mass., has a backlog of orders of between \$1.7 and \$3 million for its planned \$100,000 personal graphics supercomputer, according to Steller Founder and Chairman J. William Poduska Sr. Poduska said the backlog should augur well for the start-

Network management king? IBM is apparently grooming Rexx, a VM high-level programming language, as a Netview application development tool. The vendor plans to provide a high-level language "that begins with R and ends with X," IBM network management product marketing manager Robert Bailey told Computerworld recently. This is in response to user demand for an easier tool than IBM's C List that could be used to tailor Netview software to individual site needs. Bailey also indicated that the language will become part of IBM's SAA.

Why not the rest? Ameritech is considering whether to enter the computer leasing business via acquisition. If it decides to make such a move, the Chicago-based firm will follow a trail blazed by fellow regional holding companies Bell Atlantic and Bell South. Ameritech is the parent of mainframe data base developer Applied Data Research.

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